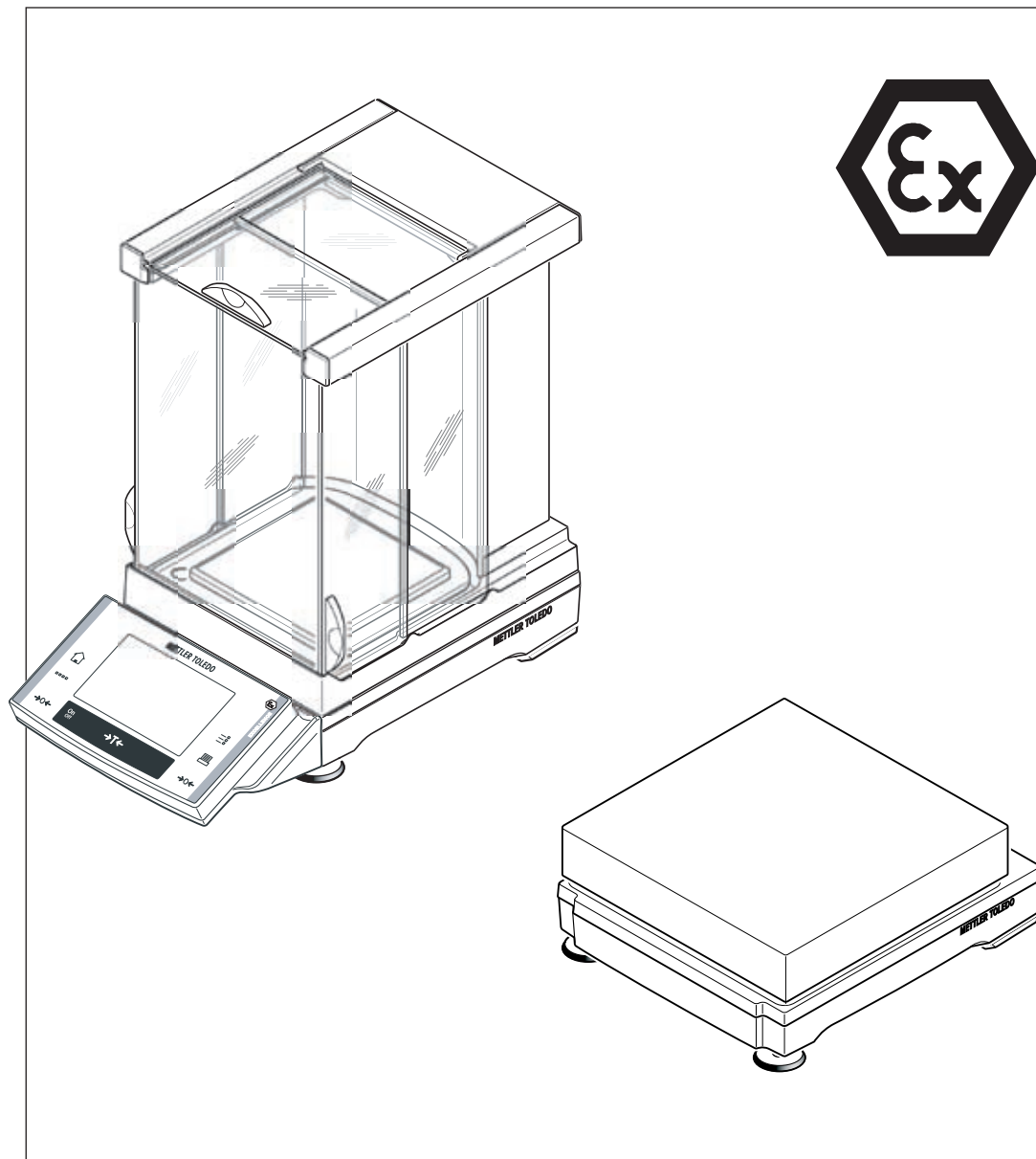


Excellence Precision Balances

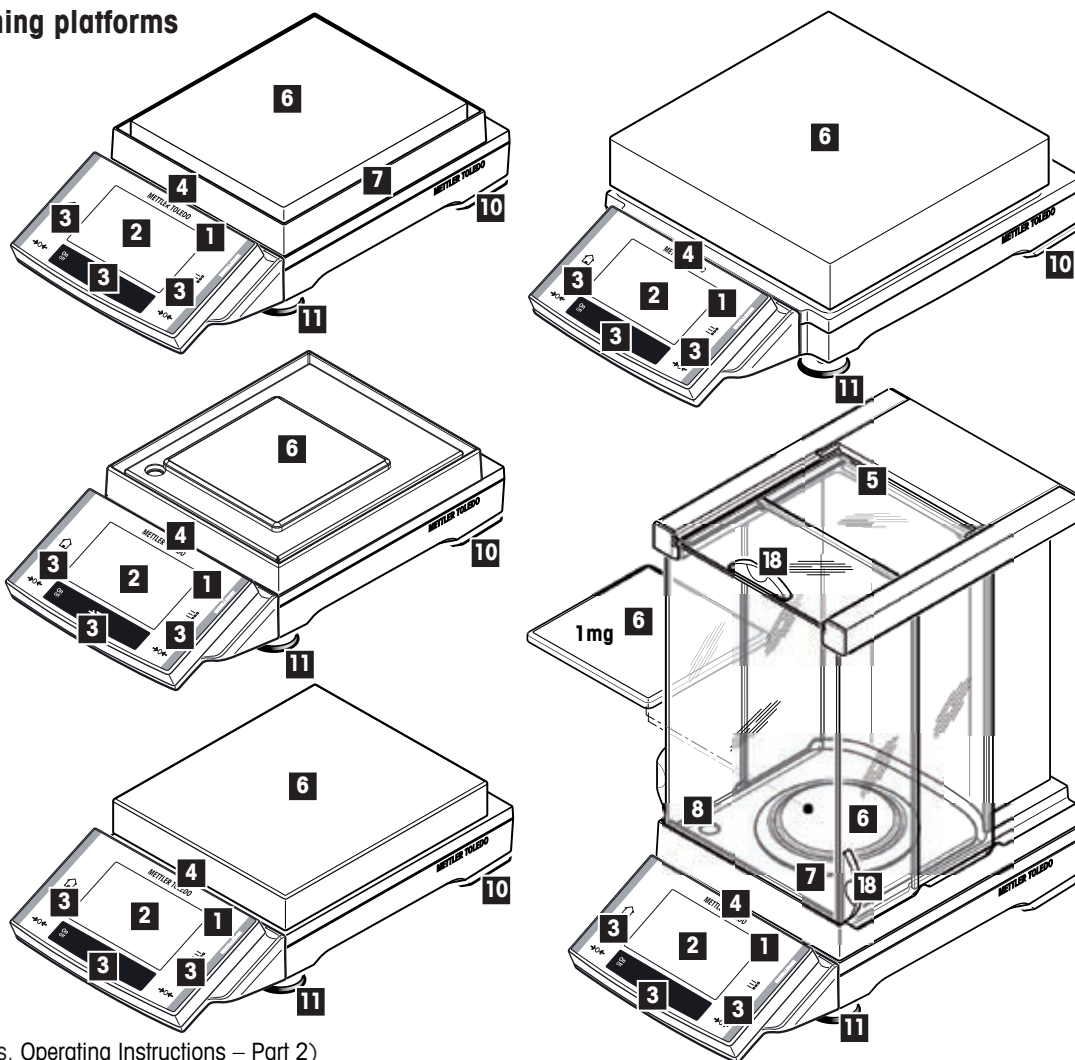
XS-Ex2 and X-Ex2 Models – Part 1



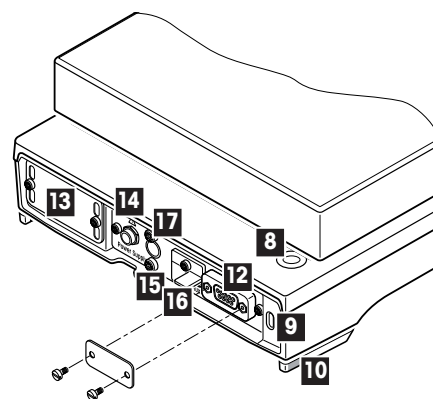
METTLER TOLEDO

Overview of Excellence Precision Balances for Ex-Zone 2

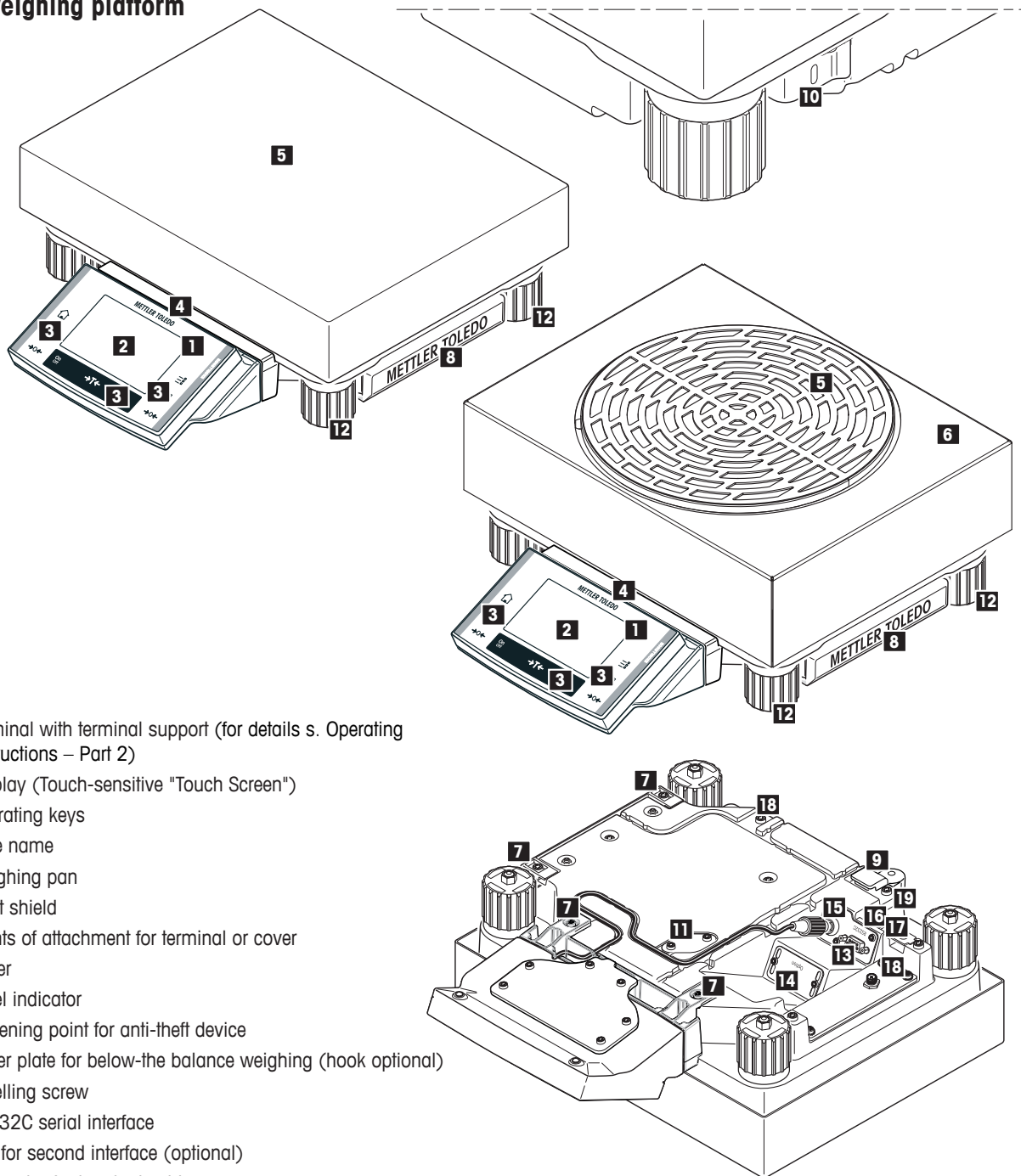
"S" and "M" weighing platforms



- 1 Terminal (for details s. Operating Instructions – Part 2)
- 2 Display (Touch-sensitive "Touch Screen")
- 3 Operating keys
- 4 Type name
- 5 Glass draft shield
- 6 Weighing pan
- 7 Draft shield element
- 8 Level indicator
- 9 Fastening point for anti-theft device
- 10 Safety feet (10 mg, 0.1 g + 1 g models)
- 11 Levelling screw
- 12 RS232C serial interface
- 13 Slot for second interface (optional)
- 14 Socket for AC adapter
- 15 Aux 1 (connection for "ErgoSens")
- 16 Aux 2 (connection for "ErgoSens")
- 17 Fastening for auxiliary display stand or terminal stand (optional)
- 18 Handle for operation of the draft-shield door



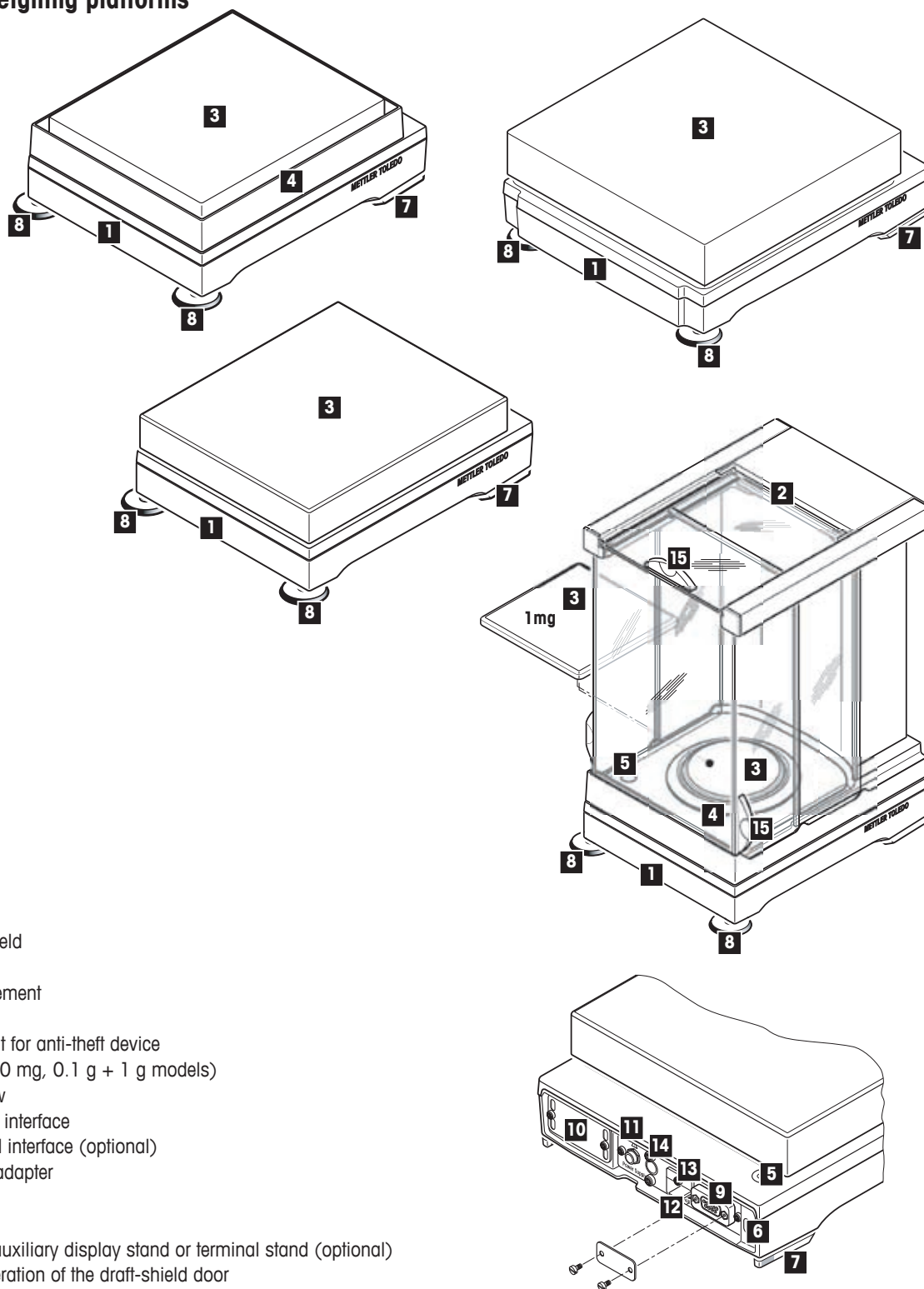
"L" weighing platform



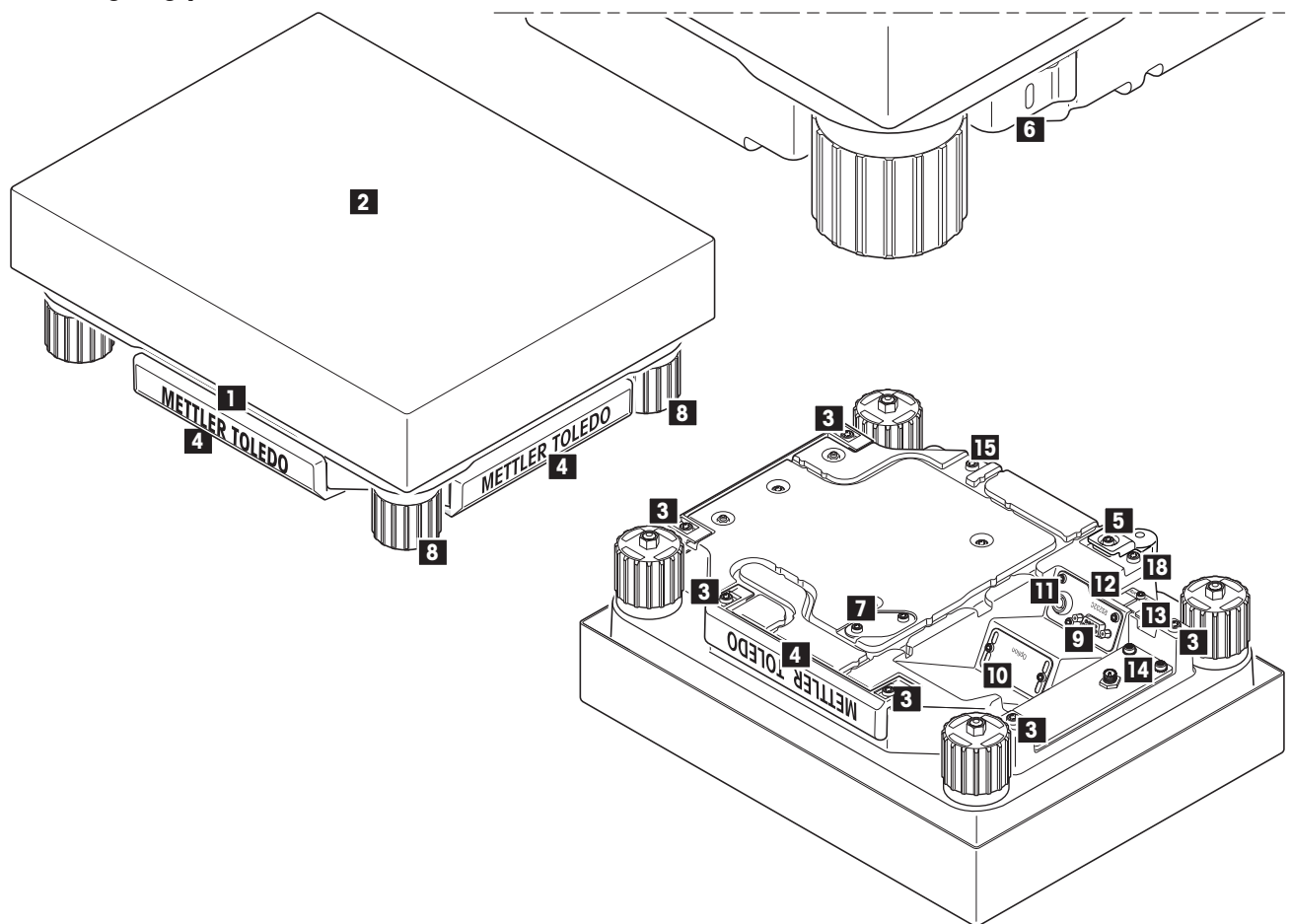
- 1 Terminal with terminal support (for details s. Operating Instructions – Part 2)
- 2 Display (Touch-sensitive "Touch Screen")
- 3 Operating keys
- 4 Type name
- 5 Weighing pan
- 6 Draft shield
- 7 Points of attachment for terminal or cover
- 8 Cover
- 9 Level indicator
- 10 Fastening point for anti-theft device
- 11 Cover plate for below-the balance weighing (hook optional)
- 12 Levelling screw
- 13 RS232C serial interface
- 14 Slot for second interface (optional)
- 15 Connector for terminal cable
- 16 Aux 1 (connection for "ErgoSens")
- 17 Aux 2 (connection for "ErgoSens")
- 18 Socket for AC adapter
- 19 Fastening for terminal stand (optional)

Overview of Excellence Precision Weighing Platforms for Ex-Zone 2

"S" and "M" weighing platforms



"L" weighing platform



- 1 Type name
- 2 Weighing pan
- 3 Points of attachment for terminal or cover
- 4 Cover
- 5 Level indicator
- 6 Fastening point for anti-theft device
- 7 Cover plate for below-the balance weighing (hook optional)
- 8 Levelling screw
- 9 RS232C serial interface
- 10 Slot for second interface (optional)
- 11 Connector for terminal cable
- 12 Aux 1
- 13 Aux 2
- 14 Socket for AC adapter
- 15 Fastening for terminal stand (optional)

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1 Getting to know your balance

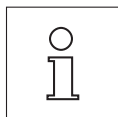
In this section you will be given basic information about your balance. Please read right through this section carefully even if you already have experience with METTLER TOLEDO balances; **please pay special attention to the safety warnings!**

1.1 Introduction

Thank you for choosing a METTLER TOLEDO balance.

Balances and platforms for use in Zone 2 hazardous areas combine a host of weighing and setting possibilities with uncommon operating comfort.

However, the different models have different characteristics regarding equipment and performance. Special notes in the text indicate where this makes a difference to operation.



The Operating Instructions for the XS-Ex2/X-Ex2 balances consist of 3 separate documents, whose contents are listed in the following subsections.

1.1.1 Operating Instructions Part 1, this document

Contents: XS-Ex2/X-Ex2 precision balances

- Introduction
- Safety notes
- Setting up the balance/weighing platform
- Leveling the balance/weighing platform
- Installation of the AC adapter PSX2
- Connection of peripheral devices and system integration
- Interface commands and MT-SICS functions
- Cleaning and service
- Technical data
- Accessories
- Spare parts
- Appendix – Certificate of the issuing institution

1.1.2 Operating Instructions Part 2, separate document (only XS-Ex2 balances)

Contents: XS-Ex2 terminal, system and applications

- Basic principles for using the terminal and the firmware
- System settings
- Applications
- Firmware (Software) Updates
- Error and status messages
- Conversion table for weight units
- Recommended printer settings

1.1.3 Operating Instructions Part 3, separate document (only XS-Ex2 balances)

Contents: XS-Ex2 adjustments and tests

- Adjustments
- Tests

1.2 Introducing the XS-Ex2 precision balances and X-Ex2 weighing platforms

The XS-Ex2/X-Ex2 family of precision balances comprises a range of precision balances which differ from each other in relation to their weighing range and resolution.

The following features are common to all models of the XS-Ex2/X-Ex2 lines:

- Type of protection: Ex nL for use in Zone 2 hazardous areas
- Fully automatic adjustment "FACT" using internal weight.
- Built-in applications for normal weighing, statistics, formulation, density, percent weighing, piece counting, dynamic weighing and LabX Client (only XS-Ex2 models).
- Integral RS232C interface.
- Slot for second interface (optional).
- Touch-sensitive graphics terminal ("Touch Screen") for easy, convenient operation (only XS-Ex2 models).

A brief word about standards, guidelines, and methods of quality assurance: The balances comply with usual standards and guidelines. They support standard procedures, specifications, working methods, and reports according to **GLP** (**Good Laboratory Practice**). In this respect, records of working procedures and adjustments become very important; for this purpose we recommend you to use a printer from the METTLER TOLEDO range, since these are optimally adapted to your balance. The balances conform to the applicable standards and guidelines and possess an CE declaration of conformity. METTLER TOLEDO is certified as manufacturer according to ISO 9001 and ISO 14001.

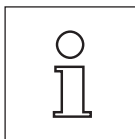
1.3 What you should know about these instructions

The following conventions apply to the Operating Instructions: Part 1, Part 2 and Part 3.

- Key designations are indicated by double angular parentheses (e.g. «**On/Off**» or «**≡**»).



These symbols indicate safety notes and hazard warnings which, if ignored, can cause personal danger to the user, damage to the balance or other equipment, or malfunctioning of the balance.



This symbol indicates additional information and notes. These make working with your balance easier, as well as ensuring that you use it correctly and economically.

1.4 Safety has priority – Intended use

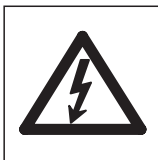
Always operate and use your balance only in accordance with the Operating Instructions Part 1, Part 2 and Part 3.

Please follow the instructions for commissioning your new balance/weighing platform carefully.

If the instrument is not used according to the manufacturer's Operating Instructions (Part 1, Part 2 and Part 3), protection of the instrument may be impaired.



- For use only in closed and clean interior rooms
- Do not use sharply pointed objects to operate the keyboard of your balance!
- Although your balance/weighing platform is very ruggedly constructed, it is nevertheless a precision instrument. Treat it with corresponding care.
- Do not open the balance/weighing platform or power supply unit. They do not contain any parts that can be maintained, repaired or replaced by the user. If you ever have problems with your balance, contact your METTLER TOLEDO dealer.
- Use only balance accessories and peripheral device from METTLER TOLEDO; they are optimally adapted to your balance.
- Use only the AC adapter PSX2 delivered with your balance/weighing platform, and check that the voltage printed on its the same as your local power supply voltage.



Approved for use in Zone 2 hazardous areas

The PSX2 AC adapter supplies the power to the XS-Ex2 precision balances and X-Ex2 precision weighing platforms for their intended use in the Ex hazardous area classified as Zone 2. In this zone, ignitable concentrations of flammable gases, vapors or liquids are not likely to occur in normal operation, and if they do occur, will exist for only a short period. The AC adapter can be installed inside or outside the Ex hazardous area.

Use in zone 1 and 0 is not permitted.



Safety instructions regarding installation and operation in the Ex hazardous area, Zone 2

- The installation may be performed only by a qualified electrician as described in this installation information.
- Check whether special clothing or special tools are needed for work in the hazardous area of the end-user and then wear or use these if required.
- Find out whether the use of certain electronic devices (cell phones, computers, etc.) is prohibited in the hazardous area of the end-user, and then follow these regulations.
- Establishing and separating the connections to the power supply are exclusively the task of the electrician(s) of the end user.
- Any modifications to the balance/weighing platform and AC adapter, as well as repairs to the assemblies, are prohibited. These actions endanger the safety of the system, result in loss of the Ex Approval, and nullify any warranty and product liability claims.
- Service work and repairs may be performed only by personnel authorized by METTLER TOLEDO.
- The classification as zone 2 must be confirmed by the regulatory body of your profession.
- Check that the balance and AC adapter are in perfect condition before putting into operation for the first time and at least every 3 years.
- It is important to observe the European Directive on Equipment Intended for Use in Potentially Explosive Atmospheres (94/9/CE)!

- Only accessories which are explicitly mentioned in this document may be used, and they must be installed and operated as described here.
- Installation work on the balance/weighing platform must be carried out outside the hazardous area.



Safety measures during operation in the Ex hazardous area, Zone 2

- AC adapter and balance may be operated only when the housing is closed.
- **The instrument must only be cleaned with a damp cloth.**



Notes

- According to Directive 94/9/EU (ATEX 95), XS-Ex2 precision balances, X-Ex2 precision weighing platforms, and the PSX2 AC adapter are Group II, Category 3G devices that, according to Directive 99/92/EU (ATEX 137), can be used in Zone 2, as well as in Gas Groups IIA, IIB and IIC, which are potentially ignitable by combustible substances in the range of Temperature Classes T1 to T5.
- For use/installation, the requirements of EN 60079-14 must be observed.

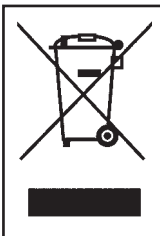
Special conditions X for the AC adapter PSX2

1. The power supply cable of the METTLER TOLEDO Type PSX2 AC adapter must be installed with protection against mechanical damage.
2. Only the special plug-connector of the output circuit may be plugged into, or unplugged from, a power-consuming device such as a balance while it is under voltage.
3. The internal inductance (including the connecting cable) of any power-consuming device connected to the AC adapter must not exceed $\leq 10 \mu\text{H}$, and its internal capacity must not exceed $\leq 213 \text{ nF}$.

Special condition X for the balance/weighing platform

1. XS-Ex2 precision balances and X-Ex2 precision weighing platforms can only be used in closed and clean interior spaces.
2. The instrument must only be cleaned using a **damp** cloth.

Technical data of the precision balances in the XS/X-Ex2 line and the AC adapter PSX2 see section 5.



Disposal

In conformance with the European Directive 2002/96/CE on Waste Electrical and Electronic Equipment (WEEE) this device may not be disposed of in domestic waste. This also applies to countries outside the EU, per their specific requirements.

Please dispose of this product in accordance with local regulations at the collecting point specified for electrical and electronic equipment.

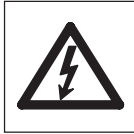
If you have any questions, please contact the responsible authority or the distributor from which you purchased this device.

Should this device be passed on to other parties (for private or professional use), the content of this regulation must also be related.

Thank you for your contribution to environmental protection.

2 Setting up the balance

In this section you will learn how to unpack your new balance/weighing platform, set it up and prepare it for operation. On completion of the steps described in this section, your balance/weighing platform is ready for operation.



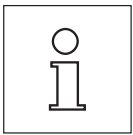
Attention

- The balance/weighing platform must be disconnected from the power supply before any set-up or installation work.
- **All unpacking, set-up, installation or disassembly work must be performed outside the hazardous area.**

2.1 Unpacking and checking the standard equipment

Open the packaging and carefully remove all components.

2.1.1 The following components are standard equipment



Note

The PSX2 AC adapter is not included in the scope of delivery for the balance/weighing platform and must be ordered separately (11132730).

All types

- XS-Ex2 balance or X-Ex2 weighing platform
- Operating instructions – Part 1 (this document)
- Operating instructions – Part 2 and Part 3 (only XS-Ex2 balances)
- Production certificate
- EC declaration of conformity

Excellence precision balance / -weighing platform with readability of 0.1 mg ("S" platform)

- Draft shield "Pro" with bottom plate and ring seal
- Draft shield element
- Weighing pan \varnothing 90 mm

Excellence precision balance / -weighing platform with readability of 0.1 mg (XS2004SX) ("S" platform)

- Draft shield element
- Weighing pan 127 x 127 mm

Excellence precision balance / -weighing platform with readability of 1 mg ("S" platform)

- Draft shield "Pro" with bottom plate
- Weighing pan support
- Weighing pan 127 x 127 mm

Excellence precision balance / -weighing platform with readability of 10 mg ("S" and "M" platform)

- Weighing pan support
- Weighing pan
 - S platform: 170 x 205 mm
 - M platform: 237 x 237 mm
- Draft shield element (S platform only)

Excellence precision balance / -weighing platform with readability of 0.1 g ("S" and "M" platform) and 1 g ("M" platform)

- Weighing pan support
- Weighing pan
 - S platform: 190 x 223 mm
 - M platform: 237 x 237 mm

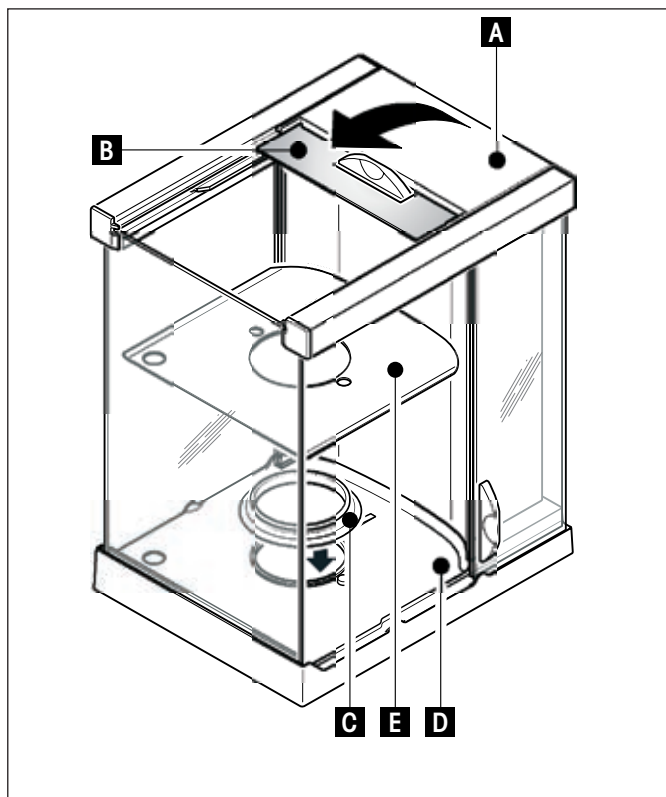
Excellence precision balance / -weighing platform with readability of 0.1 g and 1 g ("L" platform)

- Weighing pan 280 x 360 mm

Excellence precision balance / -weighing platform with readability of 1 mg and 5 mg ("L" platform)

- Draft shield
- Weighing pan \varnothing 258 mm

2.1.2 Unpacking the draft shield



- Place the draft shield on a clean surface.
- Turn so the cover (A) is vertically on top.
- Lift the carton (B) off over the handle and then pull the carton off toward the back.



Attention: Hold the glass panels firmly so they do not get pulled off and fall to the floor!

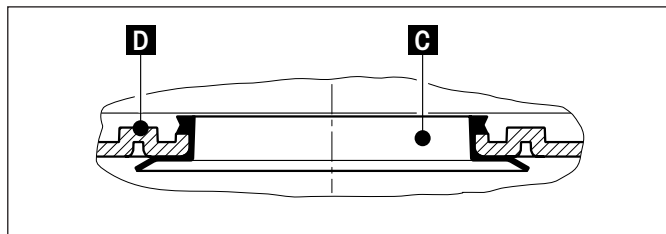
- Close the cover (A) again.
- Push all the glass panels as far as they will go to the back.

0.1 mg models

- Place the ring seal (C) into the draft shield base (D) from above.
 - Push the complete ring seal (C) through the opening in the draft shield base and then pull the top edge upward through the opening until the edge lies flat and tight all the way round.



Attention: Check by running a finger all the way round that the seal ring (C) is fitted tightly into the opening in the draft shield base (D), see illustration below.



- Insert the bottom plate (E).

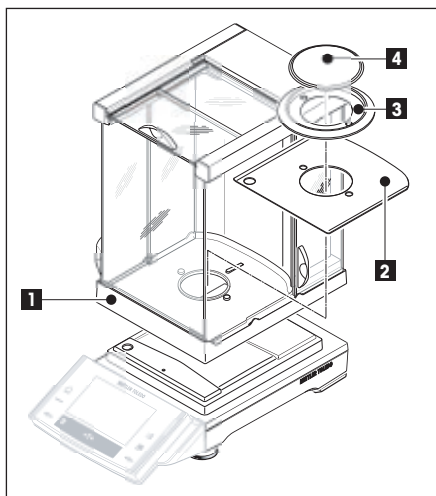
1 mg models

- Insert the bottom plate (E).

2.2 Setting up the balance/weighing platform

The size of the weighing pan depends on the readability and maximum capacity of the balance.

2.2.1 Installing the draft shield and weighing pan



Excellence precision balances/weighing platforms with readability of 0.1 mg, with draft shield ("S" platform)

Place the following components on the balance in the specified order:

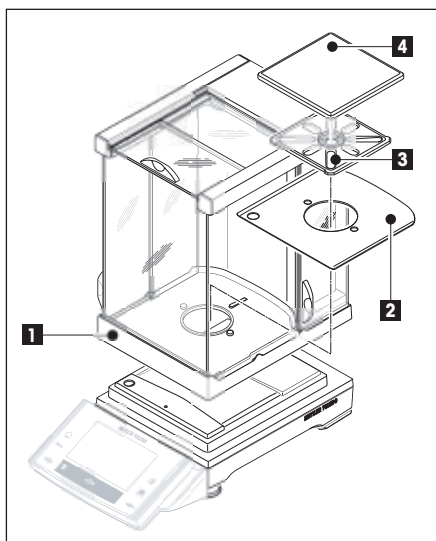


Attention: Push the side glass back as far as it will go and grasp the draft shield with both hands on the bars at the top.

- Draft shield (1) with ring seal inserted (section 2.1.2).
- Bottom plate (2), if not already inserted (section 2.1.2)!
- Draft shield element (3)
- Weighing pan (4)



Note: Cleaning the draft shield, see section 4.



Excellence precision balances/weighing platforms with readability of 1 mg, with draft shield ("S" platform)

Place the following components on the balance in the specified order:

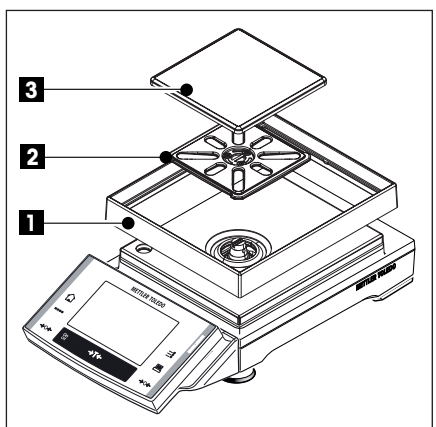


Attention: Push the side glass back as far as it will go and grasp the draft shield with both hands on the bars at the top.

- Draft shield (1)
- Bottom plate (2), if not already inserted (section 2.1.2) !
- Pan support (3)
- Weighing pan (4)



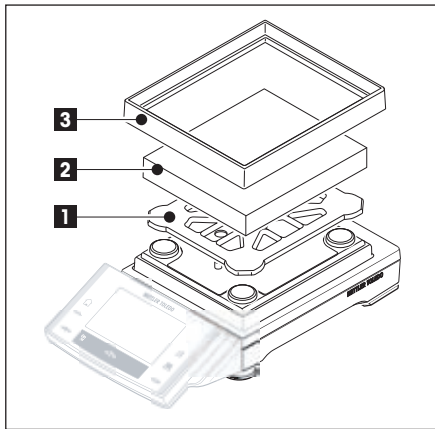
Note: Cleaning the draft shield, see section 4.



Excellence precision balances with readability of 0.1 mg ("S" platform)

Place the following components on the balance in the specified order:

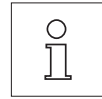
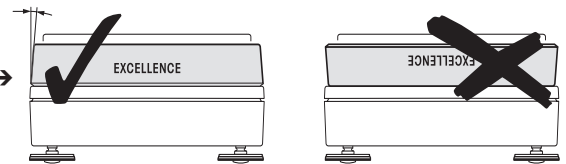
- Draft shield element (1)
- Pan support (2)
- Weighing pan (3)



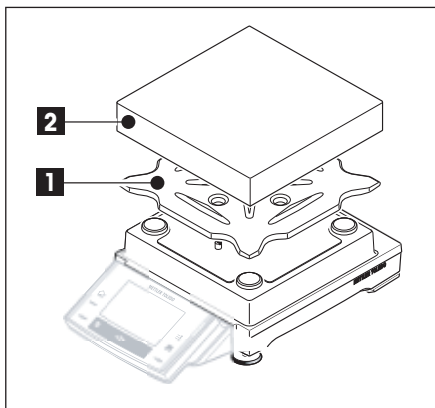
Excellence precision balances/weighing platforms with readability of 10 mg ("S" platform)

Place the following components on the balance in the specified order:

- Pan support (1)
- Weighing pan (2)
- Draft shield element (3). . . →



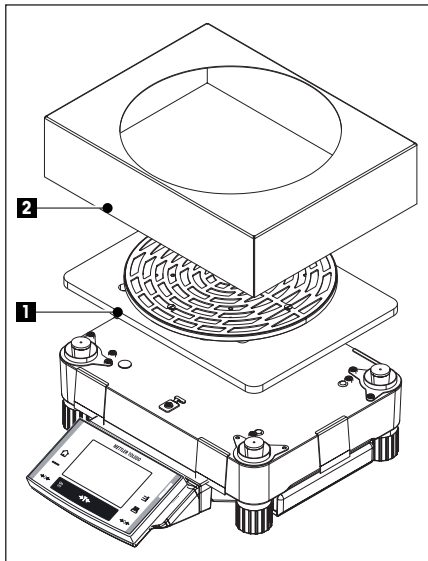
Note: It is also possible to work without the draft shield element (3). However, depending on the ambient conditions, the result may be slightly less stable.



Excellence precision balances/weighing platforms with readability of 10 mg ("M" platform), 0.1 g ("S" and "M" platform) and 1 g ("M" platform)

Place the following components on the balance in the specified order:

- Pan support (1)
- Weighing pan (2)



Excellence precision balances with readability of 1 mg and 5 mg ("L" platform)

Attention: Remove the cells of the transport lock screws!

Place the following components on the balance in the specified order:

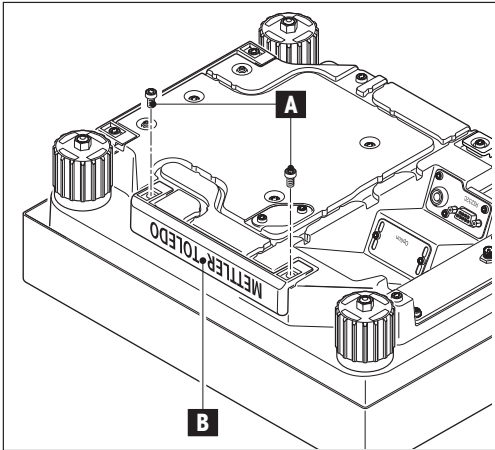
- Weighing pan (1)
- Draft shield (2)

2.2.2 Placing the terminal on the XS-Ex2 balance with "L" weighing platform



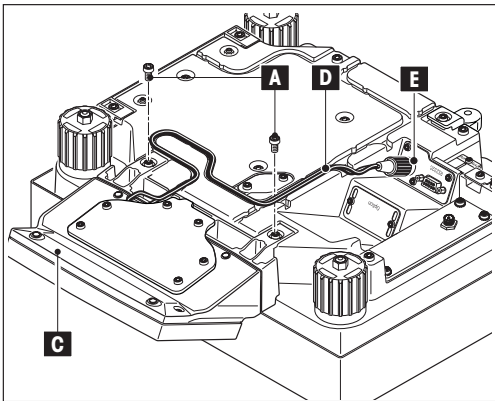
The terminal can be attached to the long or short side of the balance.

- Mount the weighing pan.
- Carefully turn the weighing platform over onto the weighing pan.

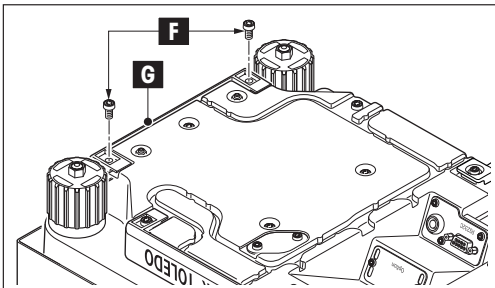


Attaching the terminal to the long side

- Dismantle the cover (B) by removing the 2 screws (A).

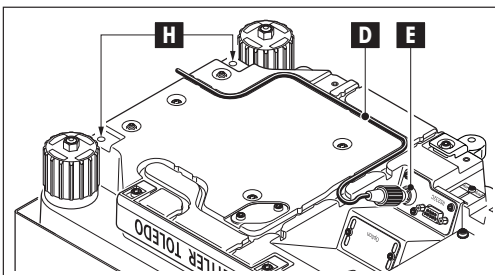


- Attach the terminal to the terminal support (C) as shown, using the screws (A) from the cover that was removed.
- Insert the terminal cable (D) into the cable channel, as shown.
- Screw the connector of the terminal cable into the socket (E).
- Turn the balance back over into position.



Attaching the terminal to the short side

- Dismantle the cover (G) by removing the 2 screws (F).

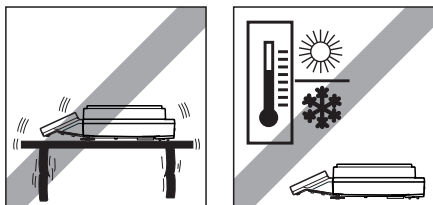


- Attach the terminal with terminal support to the points of attachment (H) with the screws (F).
- Insert the terminal cable (D) into the cable channel, as shown.
- Screw the connector of the terminal cable into the socket (E).
- Turn the balance back over into position.

2.3 Selecting the location and level of the balance/weighing platform

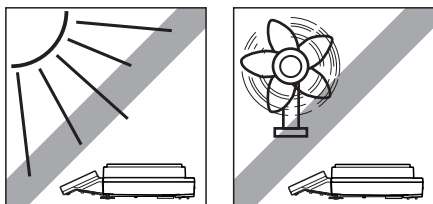
Your balance/weighing platform is a precision instrument and will thank you for an optimum location with high accuracy and dependability

2.3.1 Selecting the location



Select a stable, vibration-free position that is as horizontal as possible. The surface must be able to safely carry the weight of a fully loaded balance/weighing platform.

Observe ambient conditions (see section. 5)

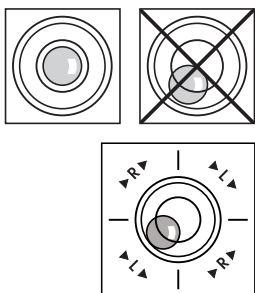


Avoid the following:

- Direct sunlight
- Draft (e.g. from fans or air conditioners)
- Excessive temperature fluctuations

Further information can be found in Weighing the Right Way.

2.3.2 Leveling the balance/weighing platform



Align the balance/weighing platform horizontally by turning the leveling screws of the weighing platform housing until the air bubble is in the inner circle of the level indicator.

The position of the air bubble illustrates which leveling screw you need to turn (L = left leveling screw, R = right leveling screw) and in which direction so that the air bubble moves to the center.

Example: In this example, turn the left leveling screw counterclockwise.

Balances with "L" platform

Align the balance horizontally by turning the leveling screws of the balance housing until the air bubble is in the inner circle of the level indicator.

Balance/weighing platform with readability of 10 mg, 0.1 g and 1 g ("S" and "M" platforms)

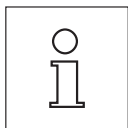
- Remove the clamps (A) for the safety feet by turning them outwards.



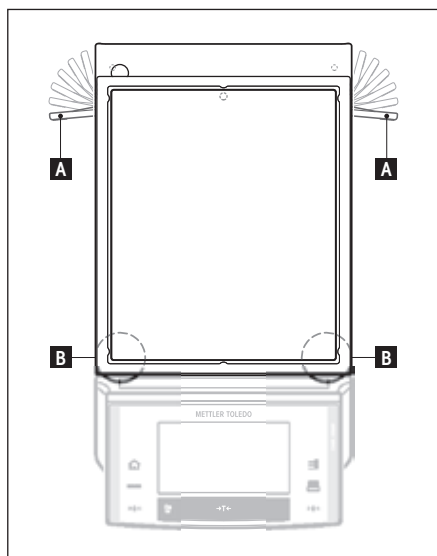
Note: Turn the clamps (A) outwards as far as they will go (~ 90°), so that the safety feet can move freely.

- Now level the balance/weighing platform by turning both leveling screws (B) until the air bubble is in the inner circle of the level indicator.

- Secure the safety feet by turning the clamps (A) inwards as far as they will go.



The balance must be leveled and adjusted each time it is moved to a new location.

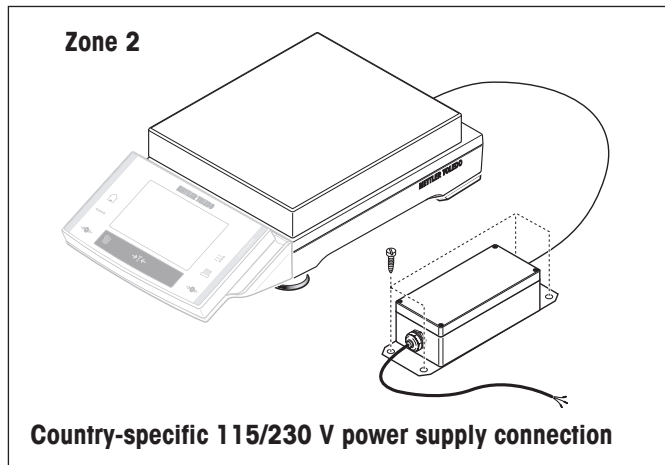


2.4 Installation of the AC adapter PSX2



- Your balance/weighing platform has been delivered with a country-specific AC adapter. Check whether the local power supply voltage is compatible with the AC adapter. **If this is not the case, on no account connect the AC adapter to the power supply** but contact your responsible METTLER TOLEDO dealer.
- **The installation may be performed only by a qualified electrician.**

2.4.1 Installation in the Ex hazardous area (Zone 2)



If the AC adapter is installed in zone 2, the power supply cable must either be connected to the screw terminals or a connection box outside the hazardous area, or to a connection box of suitable protection type within the hazardous area of the building.

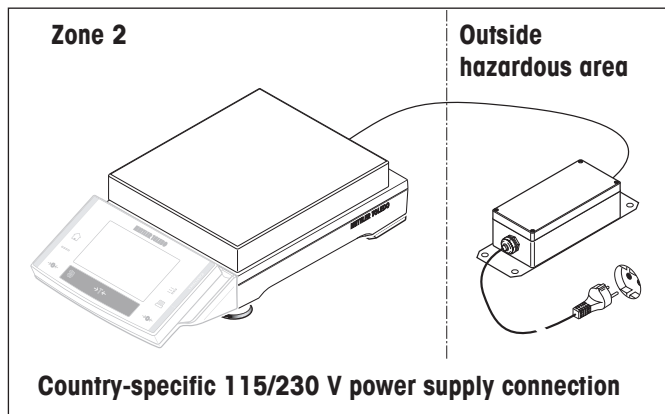
Requirement

An all-pole supply isolation device must be connected on the line side of the screw terminals of the building installation.

Procedure

- Install AC adapter in a permanent position so that it is protected against mechanical damage.
- Attach power cable to the screw terminals of the building installation as follows:
 - Core end yellow/green = ground
 - Core end black No. 1 = phase
 - Core end black No. 2 = neutral conductor
- Route power cable so that it is protected against mechanical damage.

2.4.2 Installation outside the Ex hazardous area



If the AC adapter is installed outside the hazardous area and only the balance/platform is in the hazardous area, the AC adapter can also be connected to the building installation using a commercial plug connection.

In such a case the power plug is used as a supply isolation device.

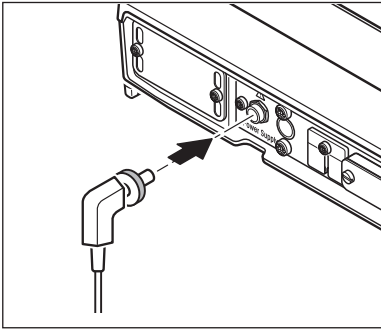
Note

The power plug is not included in the standard equipment.

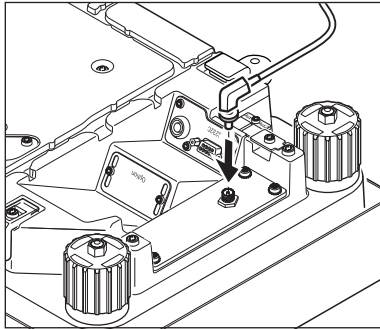
Procedure

- Install AC adapter in a permanent position so that it is protected against mechanical damage
- Connect 3-pin power plug to power cable:
 - Core end yellow/green = ground
 - Core end black No. 1 = phase
 - Core end black No. 2 = neutral conductor
- Plug power plug into receptacle outlet of the building installation.
- Route power cable so that it is protected against mechanical damage.

2.4.3 Connection to the balance/weighing platform



"S" and "M" platform



"L" platform

Connect the AC adapter to the connector socket on the backside/underside of your balance/weighing platform (see figure). Secure the connection to the balance by screwing the plug tightly.



Important

Install the cable in such a way that it will not be damaged and will not hinder day-to-day work.

Once connected to the power supply, the balance/weighing platform performs a self-test and is then ready for operation.

2.4.4 Dismantling

Disconnect AC adapter from power supply

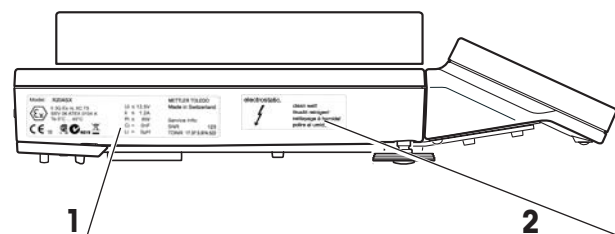
- Disconnect the power supply cable from the screw terminals of the in-house power supply in the following sequence:
 - Core end black No. 2 = neutral conductor
 - Core end black No. 1 = phase
 - Core end yellow/green = ground
- Unscrew the power supply unit
- Remove the balance and power supply cable

2.5 Marking the balance/weighing platform and the AC adapter

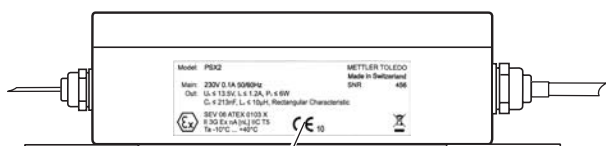
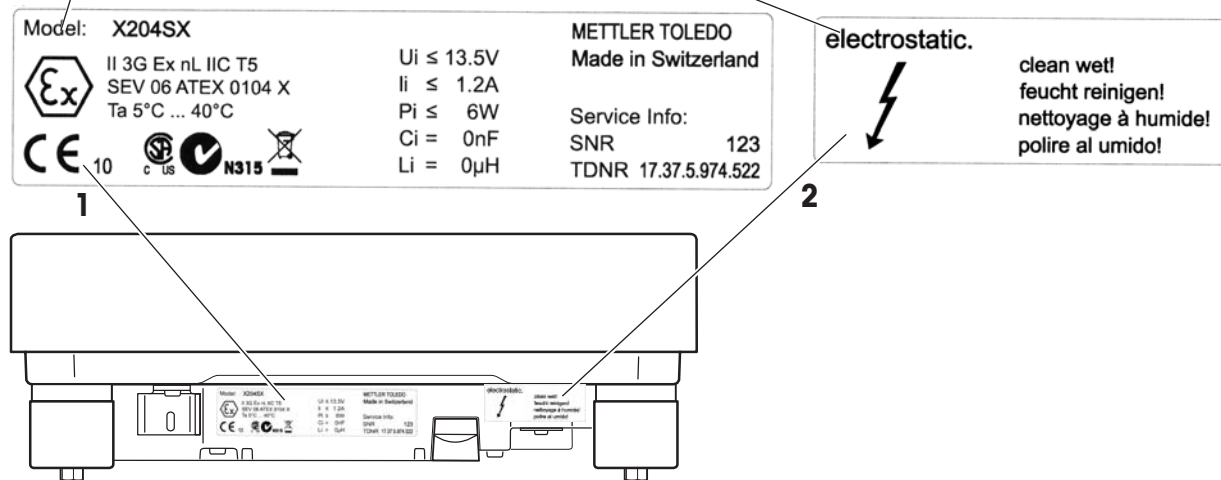


Instruments for use in hazardous areas must be marked with their type of protection and with warnings. The appropriate stickers are affixed to the balance.

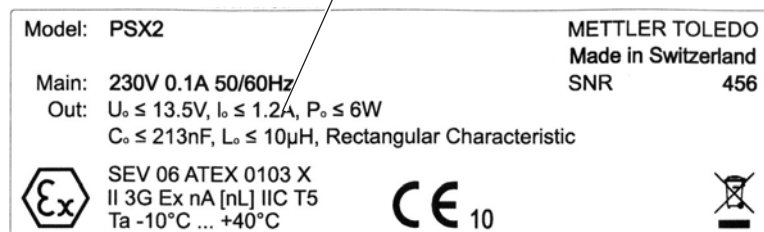
Procedure



Check to make sure **model plate with the Ex symbol (1)** and the **"Electrostatic" warning label (2)** has been applied to the balance/ weighing platform.

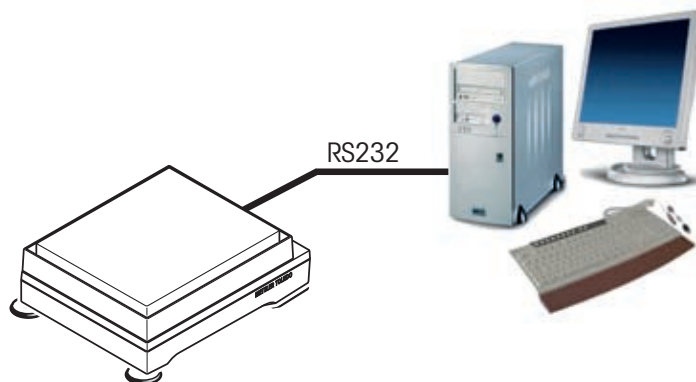


Check to make sure that the **model plate with the Ex symbol (1)** has been applied to the AC adapter.



3 Connection of peripheral devices and system integration

Many of the balances in current use, and especially weighing platforms, are normally integrated into complex computer or weighing systems. The integrated RS232 or an optional data interface can be used to capture weighing results and to control or adjust the weighing platform. Standard commands are available for this purpose.



3.1 Usage of data interface "RS232" in the Ex hazardous area (Zone 2)



The installation must be performed by a professional in accordance with the applicable regulations.

If peripheral devices are connected to the RS232 data interface of the balance in the Ex hazardous area, there are two possible cases:

3.1.1 The peripheral device «P» is located inside the Ex hazardous area

The peripheral device «P» which is used must be approved for zone 2.

a) The peripheral device «P» **does not conform to protection type Ex nL:**

In order for the energy flow via the data cable to be limited between the balance and the peripheral device «P», an energy limiter with corresponding Ex certification «B» (**Figure 1**) or an opto-electrical interface «O» (**Figure 2**) must be used.

b) The peripheral device «P» **does conform to protection type Ex nL:**

The data cable does not need a special energy limiter (**Figure 3**).

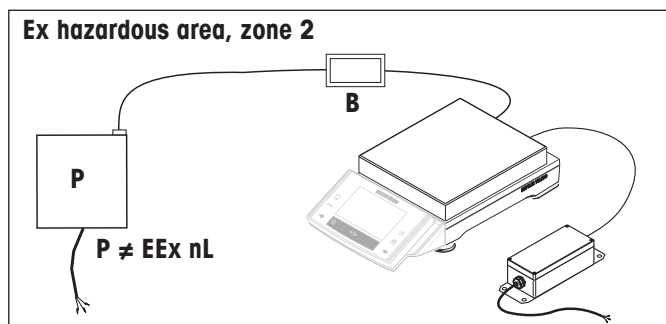


Fig 1: «B» = Standard energy limiter in housing with protection type (Ex nA [L] IIC T5).
(If «P» ≠ Ex nL).

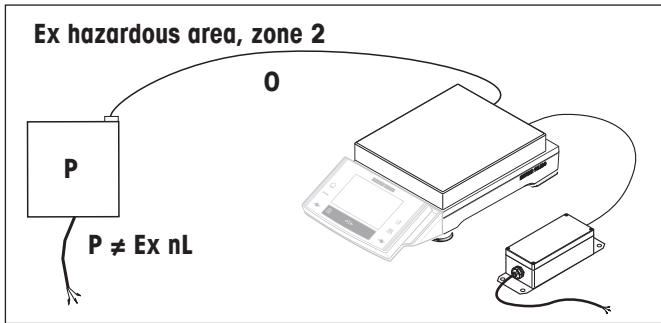


Fig 2: «O» = Opto-electric converter with galvanic isolation with 9-pin RS connector for data transmission without hardware handshake, part number 00224265. (If «P» ≠ Ex nL).

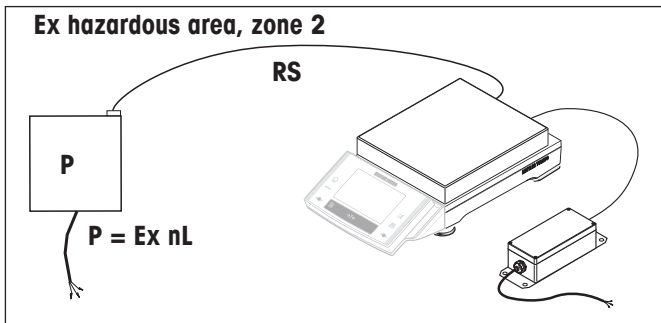


Fig 3: If the peripheral device «P» conforms to protection type **Ex nL**, no special energy limiter is necessary
RS = standard RS cable, use for circuit [Ex nL] IIC.

3.1.2 The peripheral device «P» (e.g. PC or printer) is located outside the Ex hazardous area

The peripheral device «P» does not need special approval with regard to Ex Zone 2.

In order for the energy flow via the data cable to be limited between the balance and the peripheral device «P», an energy limiter with corresponding Ex certification «B» (**Figure 4**) or an opto-electrical interface «O» (**Figure 5**) must be used.

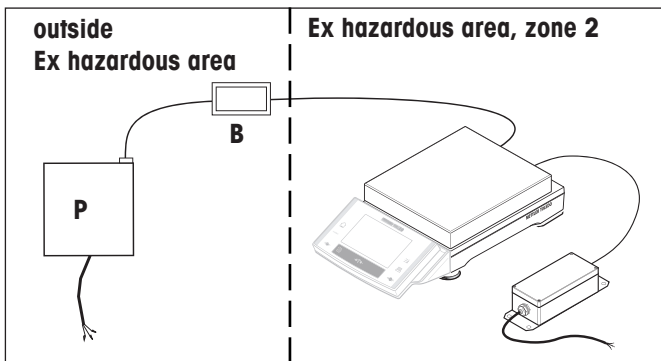


Fig. 4: «B» = Standard energy limiter in housing with protection type (Ex nA [L] IIC T5).

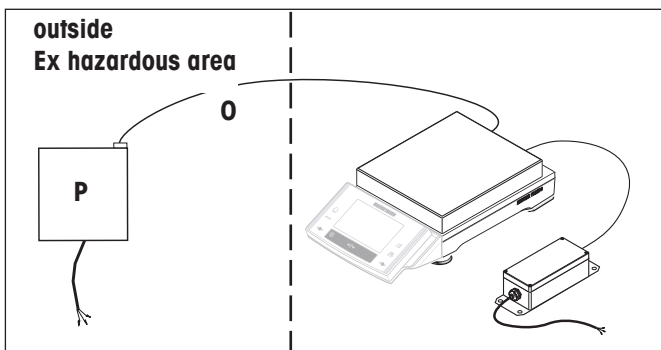
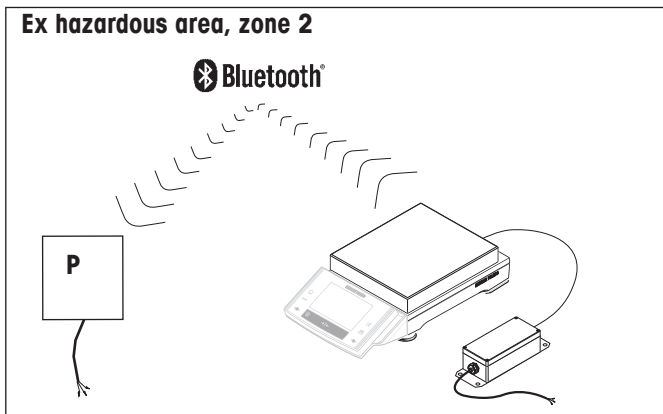


Fig 5: «O» = Opto-electric converter with galvanic isolation with 9-pin RS connector for data transmission without hardware handshake, part number 00224265.

3.2 Usage of the optional data interface "Bluetooth" in the Ex hazardous area

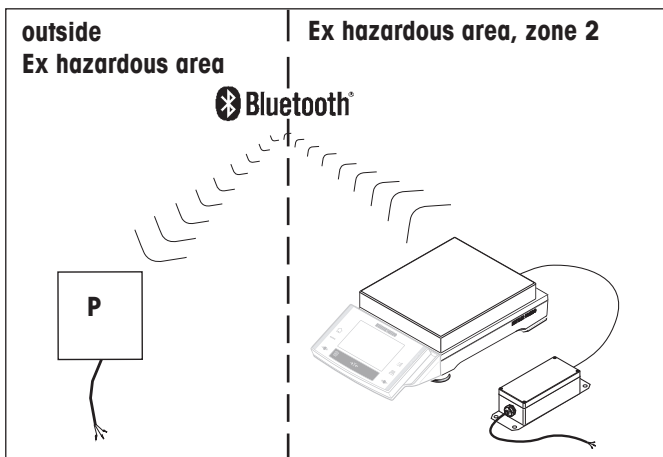
If peripheral devices are connected to the Bluetooth data interface of the balance in the Ex hazardous area, there are two possible cases:

3.2.1 The peripheral device «P» is located inside the Ex hazardous area



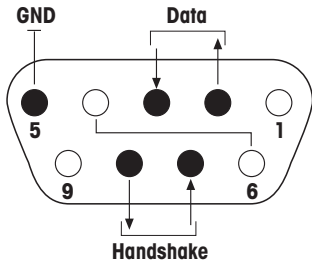
The peripheral device «P» must be approved for use in Zone 2.

3.2.2 The peripheral device «P» (e.g. printer) is located outside the Ex hazardous area



The peripheral device «P» does not need special approval for use in Zone 2.

3.3 Specifications of the RS232C interface

Interface type:	Voltage interface according to EIA RS-232C/DIN 66020 (CCITT V24/V.28)	
Max. cable length:	15 m	
Signal level:	Outputs: +5 V ... +15 V (RL = 3 – 7 kΩ) –5 V ... –15 V (RL = 3 – 7 kΩ)	Inputs: +3 V ... 25 V –3 V ... 25 V
Connector:	Sub-D, 9-pole, female	
Operating mode:	Full duplex	
Transmission mode:	Bit-serial, asynchronous	
Transmission code:	ASCII	
Baud rates:	600, 1200, 2400, 4800, 9600, 19200, 38400 ¹⁾ (firmware selectable)	
Bits/parity:	7-bit/even, 7-bit/odd, 7-bit/none, 8-bit/none (firmware selectable)	
Stop bits:	1 stop bit	
Handshake:	None, XON/XOFF, RTS/CTS (firmware selectable)	
End-of-line:	<CR><LF>, <CR>, <LF> (firmware selectable)	
	<p>Pin 2: Balance transmit line (TxD)</p> <p>Pin 3: Balance receive line (RxD))</p> <p>Pin 5: Ground signal (GND)</p> <p>Pin 7: Clear to send (hardware handshake) (CTS)</p> <p>Pin 8: Request to send (hardware handshake) (RTS)</p>	

¹⁾ 38400 baud is only possible in special cases, such as:

- Weighing platform without terminal, or
- Weighing platform with terminal, only via the optional RS232C interface.

3.4 MT-SICS interface commands and functions

To enable you to integrate balances and weighing platforms in your system in a simple manner and utilize their capabilities to the full, the balance/weighing platform functions are available as appropriate commands via the data interface.

All METTLER TOLEDO balances and weighing platforms launched support the standardized command set "METTLER TOLEDO Standard Interface Command Set" (MT-SICS). The commands available depend on the functionality of the balances and weighing platforms.

Basic information on data interchange with the balance/weighing platform

The balance/weighing platform receives commands from the system and acknowledges the command with an appropriate response.

Command formats

Commands sent to the balance/weighing platform comprise one or more characters of the ASCII character set. Here, the following must be noted:

- Enter commands only in uppercase.
- The possible parameters of the command must be separated from one another and from the command name by a space (ASCII 32 dec., in this description represented as "␣").
- The possible input for "text" is a sequence of characters of the 8-bit ASCII character set from 32 dec to 255 dec.
Note: For language-specific characters, please see the information in the "Operating Instructions – Part 2", section 3.6.
- Each command must be closed by C_RL_F (ASCII 13 dec., 10 dec.).

The characters C_RL_F, which can be inputted using the Enter or Return key of most entry keypads, are not listed in this description, but it is essential they be included for communication with the balance/weighing platform.

Example

S – Send stable weight value

Command	S	Send the current stable net weight value
Response	S␣S␣WeightValue␣Unit	Current stable weight value in unit actually set under unit 1.
	S␣I	Command not executable (balance/weighing platform is currently executing another command, e.g. taring, or timeout as stability was not reached).
	S␣+	Balance in overload range.
	S␣-	Balance in underload range.

Example

Command	S	Send a stable weight value.
Response	S␣S␣␣␣␣␣␣100.00␣g	The current, stable weight value is 100.00 g

COM – Setting of the fix RS232-interface

Command `COM┐Port┐Baud┐Bit┐HS`

Setting of the fix RS232-interface (without option)

Port: Interface

Port = 0 (fix) fix RS232

Baud: Baudrate

Baud = 4 2400 Baud

Baud = 5 4800 Baud

Baud = 6 9600 Baud (factory setting)

Baud = 7 19200 Baud

Baud = 8 38400 Baud

Bit: Bit, parity, stop bit

Bit = 3 (fix) 8 bit, no parity, 1 stop bit

HS: Handshake

HS = 1 (fix) Software HS (Xon/Xoff)

Responses `COM┐A`

`COM┐L`

Example `COM┐0┐7┐3┐1 -> COM┐A`

C0 – Inquiry/setting of calibration setting

Command `C0` **Inquiry of calibration setting**

Response `C0┐A┐x1┐x2┐" "`

Command `C0┐x1┐x2` **Set calibration setting**

x1 Calibration mode

x1 = 0 Mode = Manual

x1 = 1 Mode = Auto

x2 Calibration weight

x2 = 0 Use internal weight (factory setting)

x2 = 1 Use external weight

Responses `C0┐A` Calibration setting set.

`C0┐L` Calibration setting can not be set, e.g. parameter wrong or certified version of the weighing platform.

`C0┐I` Command not executable as the balance/weighing platform is, e.g. being tared.

Example

Command `C0┐0┐1` Set calibration setting to "Manual" and external weight.

Response `C0┐A` Calibration setting set.

Comment

Setting x1=1 and x2=0 corresponds to the menu setting "FACT" under "Calibration".

Selection of available MT-SICS commands for XS-Ex2 models

For additional commands and further information please refer to the Reference Manual MT-SICS, downloadable from the Internet under www.mt.com.

S – Send stable weight value

Command **S** Send the current stable net weight value.

SI – Send value immediately

Command **SI** Send the current net weight value, irrespective of balance stability.

SIR – Send weight value immediately and repeat

Command **SIR** Send the net weight values repeatedly, irrespective of balance stability.

Z – Zero setting

Command **Z** Zero the balance.

@ – Reset

Command **@** Resets the balance to the condition found after switching on, but without a zero setting being performed.

SR – Send weight value when load changes (Send and Repeat)

Command **SR** Send the current stable weight value and then send continuously the stable weight value after every weight change.
The weight change must be at least 12.5 % of the last stable weight value, minimum = 30d.

ST – Send stable weight after pressing key

Command **ST** Send the current stable net weight value each time when  is pressed.

SU – Send stable weight value with currently displayed unit

Command **SU** As the "S" command, but with the currently displayed unit.

MT-SICS commands available for X-Ex2 weighing platforms

For further information please refer to the Reference Manual MT-SICS, downloadable from the Internet under www.mt.com.

Commands MT-SICS level 0		DAT	Date
I0	Inquiry of all implemented MT-SICS commands	I10	Balance ID – Inquiry of balance identification
I1	Inquiry of MT-SICS level and MT-SICS versions	I11	Balance type
I2	Inquiry of balance data	I14	Inquiry of balance info
I3	Inquiry of balance SW version and type definition number	M01	Inquiry/setting of weighing mode
I4	Inquiry of serial number	M02	Inquiry/setting of environment
I5	SW-Identification number	M03	Inquiry/setting of AutoZero
S	Send stable weight value	M17	Inquiry/setting of ProFACT time criteria
SI	Send weight value immediately	M18	Inquiry/setting of ProFACT/FACT temperature criterion (Δ temp.)
SIR	Send weight value immediately and repeat	M19	Inquiry/setting of adjustment weight
Z	Zero	M20	Inquiry/setting of test weight
ZI	Zero immediately	M21	Inquiry/setting of unit
@	Reset	M27	Inquiry of adjustment history
Commands MT-SICS level 1		M28	Inquiry of temperature probe
SR	Send weight value on weight change (Send and Repeat)	M29	Inquiry/setting of value release
T	Tare	SIS	Inquiry of current net weight values
TA	Inquiry/setting of tare weight value	SNR	Send stable weight value and repeat after each deflection
TAC	Clear tare value	TIM	Time
Commands MT-SICS level 2		TST0	Inquiry/setting of the test function
C0	Inquiry/setting of calibration setting	TST1	Initiate test function in the current setting
C1	Initiate calibration according to current setting	TST2	Initiate test function with external weight
C2	Initiate calibration with external weight	TST3	Initiate test function with internal weight
C3	Initiate calibration with internal weight	UPD	Inquiry/setting of the update rate of the host interface
COM	Inquiry/Setting the communication parameters of the serial interface		

4 Cleaning and service

Every now and then, clean the weighing pan, draft shield element, draft shield (depending on the model), housing of your balance/ weighing platform using a damp cloth.

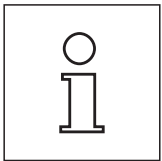
Your balance/weighing platform is made from high-quality, durable materials and can therefore be cleaned with a standard, mild cleaning agent.

Please observe the following notes



- **Balances located in the hazardous area must be damp-cleaned** to prevent the risk of spark formation through dry rubbing on plastic parts.
- Never use cleaning agents that contain solvents or abrasive ingredients.
- Make sure that no liquid penetrates the balance/weighing platform.
- Never open the balance/weighing platform or AC adapter. They do not contain any parts that can be cleaned, repaired or replaced by the user.

Attention: This also applies to the built-in clock battery in the balance/weighing platform.

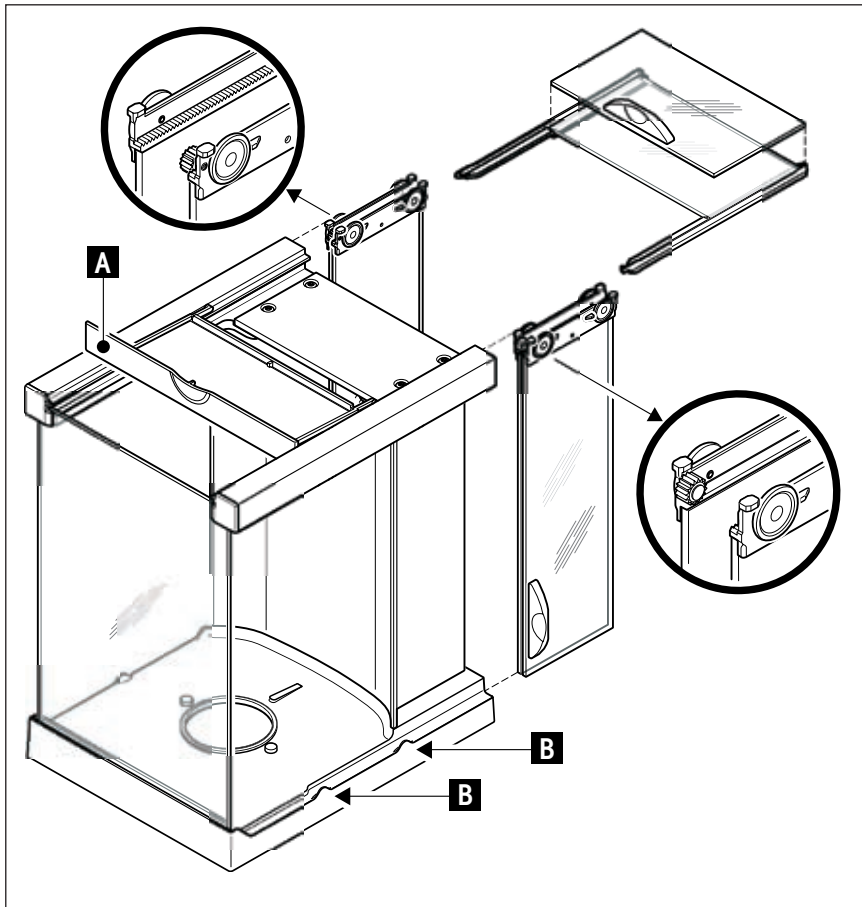


Please contact your METTLER TOLEDO dealer for details of the available service options. Regular servicing by an authorized service engineer ensures constant accuracy for years to come and prolongs the service life of your balance/weighing platform.

4.1 Cleaning the draft shield

Remove the following parts:

- Weighing pan, draft-shield element
- Lift the draft shield off the balance and place it on a clean surface.
- Remove the bottom plate.

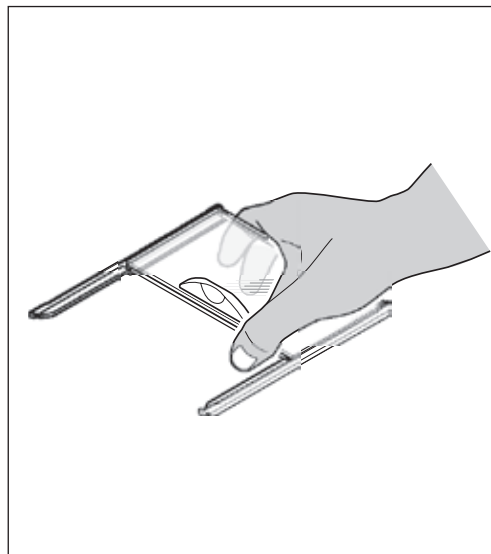
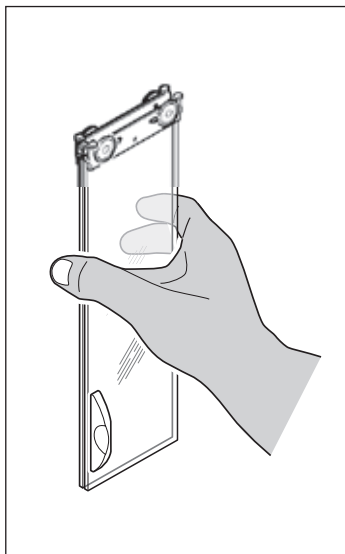


- Push all the glasses back as far as they will go.
- Turn the cover (A) to the front.
- Pull the top glass toward the back and off.
- Pull the side glasses toward the back and off.



Attention: Always hold the 2 parallel guided glasses (side glasses and top glasses) **together with one hand** (illustrations below).

- Clean all parts then reassemble the draft shield in the reverse order.



Insert glasses


Attention: Always hold the 2 parallel guided glasses (side glasses and top glasses) **together and parallel with one hand** (illustrations below). The side glasses must not be placed outside the projections (B).

5 Technical data

In this section you will find the most important technical data for your balance.


5.1 General data

Technical data AC adapter PSX2, 11132730 (external)

Dimensions:	233 x 80 x 60 mm
Hole distance:	215 x 62 mm (center mounting holes)
Weight:	1.42 kg
Line voltage:	230 V \pm 10 %, 0.1 A, 50/60 Hz / 115 V (\pm 10 %), 0.2 A, 50/60 Hz (country-specific)
Fuses:	Primary: T125L250V (230V Version) / T250L250V (115 V Version) Secondary: T500L250V
Electrical data:	$U_0 \leq 13.5$ V, $I_0 \leq 1.2$ A, $P_0 \leq 6$ W $C_0 \leq 213$ nF, $L_0 \leq 10$ μ H, rectangular characteristics
Applied standards:	IEC EN 61010-1, IEC EN 60950-1, CAN/CSA-C22.2 No. 61010-1, UL Std No. 61010A-1, EN 61326+A1+A2+A3 (Class B + Industrial environments), FCC Part 15 (Class A), AS/NZS CISPR 22, AS/NZS 61000.4.3 ATEX: EN 60079-0 (IEC 60079-0), EN 60079-15 (IEC 60079-15)
Classification:	 II 3G Ex nA [nL] IIC T5
Application range:	<ul style="list-style-type: none">• For use only in closed interior rooms• Ex hazardous area, Zone 2
Overvoltage category:	Class II
Degree of pollution:	2
Degree of protection housing:	IP 65
High above mean sea level:	Up to 4000 m
Ambient temperature:	-10 to +40 °C
Relative air humidity:	Max. 80 % at 31 °C, linearly decreasing to 50 % at 40 °C, noncondensing
Housing materials:	Die-cast aluminium, laquered

Technical data balance / weighing platform

• Protection and standards

Overvoltage category:	Class II
Degree of pollution:	2
Electrical data:	$U_i \leq 13.5$ V, $I_i \leq 1.2$ A, $P_i \leq 6$ W, $C_i = 0$ nF, $L_i = 0$ μ H
Applied standards:	IEC EN 61010-1, CAN/CSA-C22.2 No. 61010-1, UL Std No. 61010A-1, EN 61326+A1+A2+A3 (Class B + Industrial environments), FCC Part 15 (Class A), AS/NZS 4251.1, AS/NZS 61000 4252.1 ATEX: EN 60079-0 (IEC 60079-0), EN 60079-15 (IEC 60079-15)
Classification:	 II 3G Ex nL IIC T5
Degree of protection:	IP44
Application range:	<ul style="list-style-type: none">• For use only in closed and clean interior rooms• Ex hazardous area, Zone 2

• Environmental conditions

High above mean sea level:	Up to 4000 m
Ambient temperature:	+5 to +40 °C
Relative air humidity:	Max. 80 % at 31 °C, linearly decreasing to 50 % at 40 °C, noncondensing

- **Environmental conditions XS2004SX, XS26003LX, XS64003LX**

High above mean sea level: Up to 4000 m
 Ambient temperature: 10 - 30 °C ±0.3 °C / 1 h, resp. ±0.5 °C / 12 h
 Relative air humidity: 40 to 60% ±5% / 4 h
 Warm-up time: At least **12** hours after connecting the balance to the power supply.
 The balance should **not** be switched into standby mode.

- **Materials**

Housing: Die-cast aluminium, laquered, plastic and chrome steel
 Terminal: Die-cast zinc, chromed and plastics
 Weighing pan: Chrome-nickel steel ("S" and "M" platform: X2CrNiMo-17-12-2,
 "L" platform: X5CrNi18-10)
 Draft shield: Aluminium, plastic, chrome steel and glass
 Draft shield element: Die-cast zinc, chromed (10 mg models, "S" platform and XS2004SX 0.1 mg,
 "S" platform)
 Chrome steel X2 Cr Ni Mo 17 13 2 (0.1 mg models)

5.2 Model-specific data of the Excellence XS-Ex2 precision balances

5.2.1 XS-Ex2 precision balances with readability of 0.1 mg / 1 mg, "S" platform with draft shield

	XS204SX	XS603SX	XS1003SX	XS5003SXDR
Limit values				
Maximum capacity	220 g	610 g	1010 g	5.1 kg
Readability	0.1 mg	1 mg	1 mg	10 mg
Maximum capacity, fine range	—	—	—	1 kg
Readability, fine range	—	—	—	1 mg
Taring range (from...to)	0 .. 220 g	0 .. 610 g	0 .. 1010 g	0 .. 5.1 kg
Repeatability (at nominal load)	sd 0.1 mg (200 g)	0.9 mg	0.8 mg	6 mg
Repeatability, fine range (at nominal load)	sd —	—	—	1 mg
Linearity deviation	0.2 mg	2 mg	2 mg	6 mg
Eccentricity deviation (test load)	0.3 mg (100 g)	3 mg (200 g)	3 mg (500 g)	10 mg (2 kg)
Sensitivity offset (test load)	1 mg (200 g)	4.5 mg (600 g)	5 mg (1000 g)	20 mg (5 kg)
Sensitivity temperature drift ¹⁾	0.00015 %/°C	0.0002 %/°C	0.0002 %/°C	0.0003 %/°C
Sensitivity stability	0.0002 %/a	0.001 %/a	0.001 %/a	0.0015 %/a
Typical values				
Repeatability	sd 0.04 mg	0.5 mg	0.4 mg	4 mg
Repeatability, fine range	sd —	—	—	0.6 mg
Linearity deviation	0.13 mg	0.7 mg	0.7 mg	1 mg
Eccentricity deviation (test load)	0.16 mg (100 g)	0.6 mg (200 g)	0.6 mg (500 g)	0.6 mg (2 kg)
Sensitivity offset (test load)	0.8 mg (200 g)	3 mg (600 g)	3 mg (1000 g)	10 mg (5 kg)
Minimum weight (according to USP) ³⁾	120 mg	1500 mg	1200 mg	12 g
Minimum weight (@ U=1%, 2 sd) ³⁾	8 mg	100 mg	80 mg	800 mg
Minimum weight (according to USP), fine range ³⁾	—	—	—	1.8 g
Minimum weight (@ U=1%, 2 sd), fine range ³⁾	—	—	—	120 mg
Settling time	1.5 s	1.5 s	1.5 s	2 s
Dimensions				
Balance dimensions (WxDxH)	263x453x322 mm	198x366x276 mm	198x366x276 mm	214x366x363 mm
Weighing pan dimensions	78x73 mm (WxD)	127x127 mm (WxD)	127x127 mm (WxD)	127x127 mm (WxD)
Typical uncertainties and supplementary data				
Repeatability	sd 0.04mg+0.000015%·Rgr	0.5mg+0.00005%·Rgr	0.4mg+0.00002%·Rgr	4mg+0.00002%·Rgr
Repeatability, fine range	sd —	—	—	0.6mg+0.00002%·Rgr
Differential linearity deviation	sd $\sqrt{(20pg \cdot Rnt)}$	$\sqrt{(200pg \cdot Rnt)}$	$\sqrt{(120pg \cdot Rnt)}$	$\sqrt{(50pg \cdot Rnt)}$
Differential eccentric load deviation	sd 0.00008%·Rnt	0.00015%·Rnt	0.00006%·Rnt	0.000015%·Rnt
Sensitivity offset	sd 0.0002%·Rnt	0.00025%·Rnt	0.00015%·Rnt	0.0001%·Rnt
Minimum weight (according to USP) ³⁾	120mg+0.045%·Rgr	1500mg+0.15%·Rgr	1200mg+0.06%·Rgr	12g+0.06%·Rgr
Minimum weight (according to USP), fine range ³⁾	—	—	—	1.8g+0.06%·Rgr
Minimum weight (@ U=1%, 2 sd) ³⁾	8mg+0.003%·Rgr	100mg+0.01%·Rgr	80mg+0.004%·Rgr	800mg+0.004%·Rgr
Minimum weight (@ U=1%, 2 sd), fine range ³⁾	—	—	—	120mg+0.004%·Rgr
Interface update rate	23 /s	23 /s	23 /s	23 /s
Usable height of draft shield	235 mm	175 mm	175 mm	—
Weight of balance	9.1 kg	7.6 kg	7.6 kg	8.1 kg
Number of built-in reference weights ²⁾	2	1	1	1

Rgr= gross weight

Rnt = net weight (sample weight)

sd = Standard deviation

a = Year (annum)

¹⁾ In the temperature range 10...30 °C

²⁾ The reference weights are made from stainless antimagnetic chrome-nickel steel. The masses of the reference weights are traceable to the prototype kilogram which is the standard unit of mass kept in Paris.

³⁾ The minimum weight can be improved by the following measures:

- Selecting suitable weighing parameters
- Choosing a better location
- Using smaller taring containers

5.2.2 XS-Ex2 precision balances with readability of 0.1 mg, "S" platform

XS2004SX	
Limit values	
Maximum capacity	2.3 kg
Readability	0.1 mg
Maximum capacity, fine range	—
Readability, fine range	—
Taring range (from..to)	0 .. 2.3 kg
Repeatability at nominal load (ABA, measured at) ⁴⁾	0.1 mg (2 kg)
Repeatability at low load (ABA, measured at) ⁴⁾	0.08 mg (100 g)
Repeatability (at nominal load)	sd 0.35 mg
Repeatability, fine range (at nominal load)	sd —
Linearity deviation	1 mg
Eccentricity deviation (test load)	1.5 mg (1 kg)
Sensitivity offset (test load)	10 mg (2 kg)
Sensitivity temperature drift ¹⁾	0.0005 %/°C
Sensitivity stability	0.0025 %/a
Typical values	
Repeatability	sd 0.2 mg
Repeatability, fine range	sd —
Repeatability ABA (sd) typical ⁴⁾	0.06 mg
Linearity deviation	0.7 mg
Eccentricity deviation (test load)	0.3 mg (1 kg)
Sensitivity offset (test load)	1.6 mg (2 kg)
Minimum weight (according to USP) ³⁾	0.6 g
Minimum weight (@ U=1%, 2 sd) ³⁾	0.04 g
Minimum weight (according to USP), fine range ³⁾	—
Minimum weight (@ U=1%, 2 sd), fine range ³⁾	—
Settling time	10 s
Dimensions	
Balance dimensions (WxDxH)	214x366x96 mm
Weighing pan dimensions	127x127 mm (WxD)
Typical uncertainties and supplementary data	
Repeatability	sd 0.2mg+0.0000045%-Rgr
Repeatability, fine range	sd —
Repeatability ABA (sd) typical ⁴⁾	0.06mg+0.0000009%-Rgr
Differential linearity deviation	sd $\sqrt{(60\text{pg} \cdot \text{Rnt})}$
Differential eccentric load deviation	sd 0.00003%-Rnt
Sensitivity offset	sd 0.00008%-Rnt
Minimum weight (according to USP) ³⁾	600mg+0.0135%-Rgr
Minimum weight (according to USP), fine range ³⁾	—
Minimum weight (@ U=1%, 2 sd) ³⁾	40mg+0.0009%-Rgr
Minimum weight (@ U=1%, 2 sd), fine range ³⁾	—
Interface update rate	23 /s
Usable height of draft shield	—
Weight of balance	6.9 kg
Number of built-in reference weights ²⁾	1

Rgr = gross weight

Rnt = net weight (sample weight)

sd = Standard deviation

a = Year (annum)

¹⁾ In the temperature range 10...30 °C

²⁾ The reference weights are made from stainless antimagnetic chrome-nickel steel.

The masses of the reference weights are traceable to the prototype kilogram which is the standard unit of mass kept in Paris.

³⁾ The minimum weight can be improved by the following measures:

- Selecting suitable weighing parameters
- Choosing a better location
- Using smaller taring containers

⁴⁾ Value out of 5 ABA measurements according to OIML R111

5.2.3 XS-Ex2 precision balances with readability of 10 mg / 0.1 g, "S" platform

	XS4002SX	XS6002SX	XS4001SX
Limit values			
Maximum capacity	4.1 kg	6.1 kg	4.1 kg
Readability	10 mg	10 mg	100 mg
Maximum capacity, fine range	—	—	—
Readability, fine range	—	—	—
Taring range (from...to)	0 .. 4.1 kg	0 .. 6.1 kg	0 .. 4.1 kg
Repeatability (at nominal load)	sd 8 mg	8 mg	80 mg
Repeatability, fine range (at nominal load)	sd —	—	—
Linearity deviation	20 mg	20 mg	60 mg
Eccentricity deviation (test load)	30 mg (2 kg)	30 mg (2 kg)	200 mg (2 kg)
Sensitivity offset (test load)	60 mg (4 kg)	60 mg (6 kg)	240 mg (4 kg)
Sensitivity temperature drift ¹⁾	0.0003 %/°C	0.0003 %/°C	0.0015 %/°C
Sensitivity stability	0.0015 %/a	0.0015 %/a	0.005 %/a
Typical values			
Repeatability	sd 4 mg	4 mg	40 mg
Repeatability, fine range	sd —	—	—
Linearity deviation	7 mg	7 mg	20 mg
Eccentricity deviation (test load)	6 mg (2 kg)	6 mg (2 kg)	32 mg (2 kg)
Sensitivity offset (test load)	32 mg (4 kg)	30 mg (6 kg)	160 mg (4 kg)
Minimum weight (according to USP) ³⁾	12 g	12 g	120 g
Minimum weight (@ U=1%, 2 sd) ³⁾	800 mg	800 mg	8 g
Minimum weight (according to USP), fine range ³⁾	—	—	—
Minimum weight (@ U=1%, 2 sd), fine range ³⁾	—	—	—
Settling time	1.2 s	1.2 s	0.8 s
Dimensions			
Balance dimensions (WxDxH)	194x366x96 mm	194x366x96 mm	194x366x96 mm
Weighing pan dimensions	170x205 mm (WxD)	170x205 mm (WxD)	190x223 mm (WxD)
Typical uncertainties and supplementary data			
Repeatability	sd 4mg+0.00005%-Rgr	4mg+0.00003%-Rgr	40mg+0.0005%-Rgr
Repeatability, fine range	sd —	—	—
Differential linearity deviation	sd $\sqrt{(3ng \cdot Rnt)}$	$\sqrt{(2ng \cdot Rnt)}$	$\sqrt{(25ng \cdot Rnt)}$
Differential eccentric load deviation	sd 0.00015%-Rnt	0.00015%-Rnt	0.0008%-Rnt
Sensitivity offset	sd 0.0004%-Rnt	0.00025%-Rnt	0.002%-Rnt
Minimum weight (according to USP) ³⁾	12g+0.15%-Rgr	12g+0.09%-Rgr	120g+1.5%-Rgr
Minimum weight (according to USP), fine range ³⁾	—	—	—
Minimum weight (@ U=1%, 2 sd) ³⁾	800mg+0.01%-Rgr	800mg+0.006%-Rgr	8g+0.1%-Rgr
Minimum weight (@ U=1%, 2 sd), fine range ³⁾	—	—	—
Interface update rate	23 /s	23 /s	23 /s
Usable height of draft shield	—	—	—
Weight of balance	6.9 kg	6.9 kg	6.4 kg
Number of built-in reference weights ²⁾	1	1	1

Rgr = gross weight

Rnt = net weight (sample weight)

sd = Standard deviation

a = Year (annum)

¹⁾ In the temperature range 10...30 °C

²⁾ The reference weights are made from stainless antimagnetic chrome-nickel steel. The masses of the reference weights are traceable to the prototype kilogram which is the standard unit of mass kept in Paris.

³⁾ The minimum weight can be improved by the following measures:

- Selecting suitable weighing parameters
- Choosing a better location
- Using smaller taring containers

5.2.4 XS-Ex2 precision balances with readability of 10 mg / 0.1 g, "M" platform

		XS6002MXDR	XS6001MX	XS12001MX
Limit values				
Maximum capacity		6.1 kg	6.1 kg	12.1 kg
Readability		100 mg	100 mg	1000 mg
Maximum capacity, fine range		1.2 kg	—	2.4 kg
Readability, fine range		10 mg	—	100 mg
Taring range (from...to)		0 .. 6.1 kg	0 .. 6.1 kg	0 .. 12.1 kg
Repeatability (at nominal load)	sd	60 mg	80 mg	600 mg
Repeatability, fine range (at nominal load)	sd	10 mg	—	80 mg
Linearity deviation		60 mg	60 mg	600 mg
Eccentricity deviation (test load)		100 mg (2 kg)	200 mg (2 kg)	1000 mg (5 kg)
Sensitivity offset (test load)		150 mg (6 kg)	240 mg (6 kg)	600 mg (12 kg)
Sensitivity temperature drift ¹⁾		0.0003 %/°C	0.0015 %/°C	0.0015 %/°C
Sensitivity stability		0.0015 %/a	0.005 %/a	0.005 %/a
Typical values				
Repeatability	sd	40 mg	40 mg	400 mg
Repeatability, fine range	sd	6 mg	—	40 mg
Linearity deviation		7 mg	19 mg	34 mg
Eccentricity deviation (test load)		10 mg (2 kg)	32 mg (2 kg)	30 mg (5 kg)
Sensitivity offset (test load)		60 mg (6 kg)	180 mg (6 kg)	290 mg (12 kg)
Minimum weight (according to USP) ³⁾		120 g	120 g	1200 g
Minimum weight (@ U=1%, 2 sd) ³⁾		8 g	8 g	80 g
Minimum weight (according to USP), fine range ³⁾		18 g	—	120 g
Minimum weight (@ U=1%, 2 sd), fine range ³⁾		1.2 g	—	8 g
Settling time		1.5 s	1 s	1 s
Dimensions				
Balance dimensions (WxDxH)		240x393x110 mm	240x393x110 mm	240x393x110 mm
Weighing pan dimensions		237x237 mm (WxD)	237x237 mm (WxD)	237x237 mm (WxD)
Typical uncertainties and supplementary data				
Repeatability	sd	40mg+0.00015%-Rgr	40mg+0.0003%-Rgr	400mg+0.0008%-Rgr
Repeatability, fine range	sd	6mg+0.00015%-Rgr	—	40mg+0.0008%-Rgr
Differential linearity deviation	sd	√(2ng·Rnt)	√(15ng·Rnt)	√(25ng·Rnt)
Differential eccentric load deviation	sd	0.00025%·Rnt	0.0008%·Rnt	0.0003%·Rnt
Sensitivity offset	sd	0.0005%·Rnt	0.0015%·Rnt	0.0012%·Rnt
Minimum weight (according to USP) ³⁾		120g+0.45%·Rgr	120g+0.9%·Rgr	1200g+2.4%·Rgr
Minimum weight (according to USP), fine range ³⁾		18g+0.45%·Rgr	—	120g+2.4%·Rgr
Minimum weight (@ U=1%, 2 sd) ³⁾		8g+0.03%·Rgr	8g+0.06%·Rgr	80g+0.16%·Rgr
Minimum weight (@ U=1%, 2 sd), fine range ³⁾		1.2g+0.03%·Rgr	—	8g+0.16%·Rgr
Interface update rate		23 /s	23 /s	23 /s
Usable height of draft shield		—	—	—
Weight of balance		8 kg	8 kg	8 kg
Number of built-in reference weights ²⁾		1	1	1

Rgr = gross weight

Rnt = net weight (sample weight)

sd = Standard deviation

a = Year (annum)

¹⁾ In the temperature range 10...30 °C

²⁾ The reference weights are made from stainless antimagnetic chrome-nickel steel. The masses of the reference weights are traceable to the prototype kilogram which is the standard unit of mass kept in Paris.

³⁾ The minimum weight can be improved by the following measures:

- Selecting suitable weighing parameters
- Choosing a better location
- Using smaller taring containers

The precision balances with "M" platform are no longer available.

5.2.5 XS-Ex2 precision balances with readability of 1 mg / 5 mg, "L" platform

	XS26003LX	XS64003LX
Limit values		
Maximum capacity	26.1 kg	64.1 kg
Readability	1 mg	5 mg
Maximum capacity, fine range	—	—
Readability, fine range	—	—
Taring range (from..to)	0 .. 26.1 kg	0 .. 64.1 kg
Repeatability at nominal load (ABA, measured at) ⁴⁾	3 mg (26 kg)	10 mg (60 kg)
Repeatability at low load (ABA, measured at) ⁴⁾	2.5 mg (1 kg)	6 mg (5 kg)
Repeatability (at nominal load)	sd 5 mg	40 mg
Repeatability, fine range (at nominal load)	sd —	—
Linearity deviation	25 mg	50 mg
Eccentricity deviation (test load)	0.2 g (8 kg)	0.35 g (24 kg)
Sensitivity offset (test load)	240 mg (24 kg)	960 mg (64 kg)
Sensitivity temperature drift ¹⁾	0.0003 %/°C	0.0003 %/°C
Sensitivity stability	0.0015 %/a	0.0015 %/a
Typical values		
Repeatability	sd 2 mg	4 mg
Repeatability, fine range	sd —	—
Linearity deviation	17.5 mg	35 mg
Eccentricity deviation (test load)	40 mg (8 kg)	70 mg (24 kg)
Sensitivity offset (test load)	48 mg (24 kg)	260 mg (64 kg)
Minimum weight (according to USP) ³⁾	6 g	12 g
Minimum weight (@ U=1 %, 2 sd) ³⁾	400 mg	800 mg
Minimum weight (according to USP), fine range ³⁾	—	—
Minimum weight (@ U=1 %, 2 sd), fine range ³⁾	—	—
Settling time	10 s	10 s
Dimensions		
Balance dimensions (WxDxH)	360x410x147 mm	360x410x147 mm
Weighing pan dimensions	258 mm (Ø)	258 mm (Ø)
Typical uncertainties and supplementary data		
Repeatability	sd 2mg+0.000006%-Rgr	4mg+0.000023%-Rgr
Repeatability ABA (sd) typical ⁴⁾	1.5mg+0.000002%-Rgr	3.5mg+0.0000094%-Rgr
Repeatability, fine range	sd —	—
Differential linearity deviation	sd $\sqrt{(5pg \cdot Rnt)}$	$\sqrt{(4pg \cdot Rnt)}$
Differential eccentric load deviation	sd 0.0001 %-Rnt	0.00015 %-Rnt
Sensitivity offset	sd 0.0001 %-Rnt	0.0002 %-Rnt
Minimum weight (according to USP) ³⁾	6g+0.018 %-Rgr	12g+0.069 %-Rgr
Minimum weight (according to USP), fine range ³⁾	—	—
Minimum weight (@ U=1 %, 2 sd) ³⁾	400mg+0.0012 %-Rgr	800mg+0.0046 %-Rgr
Minimum weight (@ U=1 %, 2 sd), fine range ³⁾	—	—
Interface update rate	23 /s	23 /s
Usable height of draft shield	—	—
Weight of balance	15.7 kg	15.7 kg
Number of built-in reference weights ²⁾	2	2

Rgr= gross weight

Rnt= net weight (sample weight)

sd = Standard deviation

a = Year (annum)

¹⁾ In the temperature range 10...30 °C

²⁾ The reference weights are made from stainless antimagnetic chrome-nickel steel.
The masses of the reference weights are traceable to the prototype kilogram which is the standard unit of mass kept in Paris.

³⁾ The minimum weight can be improved by the following measures:

- Selecting suitable weighing parameters
- Choosing a better location
- Using smaller taring containers

⁴⁾ Value out of 5 ABA measurements according to OIML R111

5.2.6 XS-Ex2 precision balances with readability of 0.1 g / 1 g, "L" platform

	XS32001LX	XS32000LX	XS64001LX	XS64000LX
Limit values				
Maximum capacity	32.1 kg	32.1 kg	64.1 kg	64.1 kg
Readability	100 mg	1000 mg	100 mg	1000 mg
Maximum capacity, fine range	—	—	—	—
Readability, fine range	—	—	—	—
Taring range (from...to)	0 .. 32.1 kg	0 .. 32.1 kg	0 .. 64.1 kg	0 .. 64.1 kg
Repeatability (at nominal load)	sd 80 mg	600 mg	100 mg	600 mg
Repeatability, fine range (at nominal load)	sd —	—	—	—
Linearity deviation	300 mg	600 mg	500 mg	600 mg
Eccentricity deviation (test load)	300 mg (10 kg)	1000 mg (10 kg)	500 mg (20 kg)	1000 mg (20 kg)
Sensitivity offset (test load)	960 mg (32 kg)	1920 mg (32 kg)	1280 mg (64 kg)	1920 mg (64 kg)
Sensitivity temperature drift ¹⁾	0.001 %/°C	0.0015 %/°C	0.001 %/°C	0.0015 %/°C
Sensitivity stability	0.003 %/a	0.005 %/a	0.005 %/a	0.003 %/a
Typical values				
Repeatability	sd 40 mg	400 mg	40 mg	400 mg
Repeatability, fine range	sd —	—	—	—
Linearity deviation	200 mg	400 mg	320 mg	400 mg
Eccentricity deviation (test load)	200 mg (10 kg)	600 mg (10 kg)	320 mg (20 kg)	600 mg (20 kg)
Sensitivity offset (test load)	320 mg (32 kg)	650 mg (32 kg)	380 mg (64 kg)	650 mg (64 kg)
Minimum weight (according to USP) ³⁾	120 g	1200 g	120 g	1200 g
Minimum weight (@ U=1%, 2 sd) ³⁾	8 g	80 g	8 g	80 g
Minimum weight (according to USP), fine range ³⁾	—	—	—	—
Minimum weight (@ U=1%, 2 sd), fine range ³⁾	—	—	—	—
Settling time	1.5 s	1.2 s	1.8 s	1.5 s
Dimensions				
Balance dimensions (WxDxH)	360x404x130 mm	360x404x130 mm	362x404x131 mm	362x404x131 mm
Weighing pan dimensions	360x280 mm (WxD)	360x280 mm (WxD)	362x282 mm (WxD)	362x282 mm (WxD)
Typical uncertainties and supplementary data				
Repeatability	sd 40mg+0.00006%-Rgr	400mg+0.0003%-Rgr	40mg+0.00006%-Rgr	400mg+0.0003%-Rgr
Repeatability, fine range	sd —	—	—	—
Differential linearity deviation	sd $\sqrt{(300\text{ng} \cdot \text{Rnt})}$	$\sqrt{(1.2\mu\text{g} \cdot \text{Rnt})}$	$\sqrt{(400\text{ng} \cdot \text{Rnt})}$	$\sqrt{(600\text{ng} \cdot \text{Rnt})}$
Differential eccentric load deviation	sd 0.001%-Rnt	0.003%-Rnt	0.0008%-Rnt	0.0015%-Rnt
Sensitivity offset	sd 0.0005%-Rnt	0.001%-Rnt	0.0003%-Rnt	0.0005%-Rnt
Minimum weight (according to USP) ³⁾	120g+0.18%-Rgr	1200g+0.9%-Rgr	120g+0.18%-Rgr	1200g+0.9%-Rgr
Minimum weight (according to USP), fine range ³⁾	—	—	—	—
Minimum weight (@ U=1%, 2 sd) ³⁾	8g+0.012%-Rgr	80g+0.06%-Rgr	8g+0.012%-Rgr	80g+0.06%-Rgr
Minimum weight (@ U=1%, 2 sd), fine range ³⁾	—	—	—	—
Interface update rate	23 /s	23 /s	23 /s	23 /s
Usable height of draft shield	—	—	—	—
Weight of balance	12.4 kg	12.4 kg	14.1 kg	14.1 kg
Number of built-in reference weights ²⁾	2	2	2	2

Rgr = gross weight

Rnt = net weight (sample weight)

sd = Standard deviation

a = Year (annum)

¹⁾ In the temperature range 10...30 °C

²⁾ The reference weights are made from stainless antimagnetic chrome-nickel steel. The masses of the reference weights are traceable to the prototype kilogram which is the standard unit of mass kept in Paris.

³⁾ The minimum weight can be improved by the following measures:

- Selecting suitable weighing parameters
- Choosing a better location
- Using smaller taring containers

5.3 Model-specific data of the Excellence X-Ex2 precision weighing platforms

5.3.1 X-Ex2 precision weighing platform with readability of 0.1 mg / 1 mg, "S" platform with draft shield

	X204SX	X603SX	X1003SX	X5003SXDR
Limit values				
Maximum capacity	210 g	610 g	1010 g	5.1 kg
Readability	0.1 mg	1 mg	1 mg	10 mg
Maximum capacity, fine range	—	—	—	1 kg
Readability, fine range	—	—	—	1 mg
Taring range (from...to)	0 .. 210 g	0 .. 610 g	0 .. 1010 g	0 .. 5.1 kg
Repeatability (at nominal load)	sd 0.2 mg	0.9 mg	0.8 mg	6 mg
Repeatability, fine range (at nominal load)	sd —	—	—	1 mg
Linearity deviation	0.2 mg	2 mg	2 mg	6 mg
Eccentricity deviation (test load)	0.3 mg (100 g)	3 mg (200 g)	3 mg (500 g)	10 mg (2 kg)
Sensitivity offset (test load)	1 mg (200 g)	4.5 mg (600 g)	5 mg (1000 g)	20 mg (5 kg)
Sensitivity temperature drift ¹⁾	0.00015 %/°C	0.0002 %/°C	0.0002 %/°C	0.0003 %/°C
Sensitivity stability	0.00025 %/a	0.001 %/a	0.001 %/a	0.0015 %/a
Typical values				
Repeatability	sd 0.12 mg	0.5 mg	0.4 mg	4 mg
Repeatability, fine range	sd —	—	—	0.6 mg
Linearity deviation	0.07 mg	0.7 mg	0.7 mg	1 mg
Eccentricity deviation (test load)	0.08 mg (100 g)	0.8 mg (200 g)	0.6 mg (500 g)	0.6 mg (2 kg)
Sensitivity offset (test load)	0.4 mg (200 g)	2.4 mg (600 g)	3 mg (1000 g)	10 mg (5 kg)
Minimum weight (according to USP) ³⁾	360 mg	1500 mg	1200 mg	12 g
Minimum weight (@ U=1 %, 2 sd) ³⁾	24 mg	100 mg	80 mg	800 mg
Minimum weight (according to USP), fine range ³⁾	—	—	—	1.8 g
Minimum weight (@ U=1 %, 2 sd), fine range ³⁾	—	—	—	120 mg
Settling time	2 s	1.5 s	1.5 s	2 s
Dimensions				
Balance dimensions (WxDxH)	214x260x363 mm	198x257x276 mm	214x260x363 mm	198x257x276 mm
Weighing pan dimensions	90 mm (Ø)	127x127 mm (WxD)	127x127 mm (WxD)	127x127 mm (WxD)
Typical uncertainties and supplementary data				
Repeatability	sd 0.12mg+0.000015%-Rgr	0.5mg+0.000025%-Rgr	0.4mg+0.00002%-Rgr	4mg+0.00002%-Rgr
Repeatability, fine range	sd —	—	—	0.6mg+0.00002%-Rgr
Differential linearity deviation	sd $\sqrt{(6pg \cdot Rnt)}$	$\sqrt{(200pg \cdot Rnt)}$	$\sqrt{(120pg \cdot Rnt)}$	$\sqrt{(50pg \cdot Rnt)}$
Differential eccentric load deviation	sd 0.00004%-Rnt	0.0002%-Rnt	0.00006%-Rnt	0.000015%-Rnt
Sensitivity offset	sd 0.0001%-Rnt	0.0002%-Rnt	0.00015%-Rnt	0.0001%-Rnt
Minimum weight (according to USP) ³⁾	360mg+0.045%-Rgr	1500mg+0.075%-Rgr	1200mg+0.06%-Rgr	12g+0.06%-Rgr
Minimum weight (according to USP), fine range ³⁾	—	—	—	1.8g+0.06%-Rgr
Minimum weight (@ U=1 %, 2 sd) ³⁾	24mg+0.003%-Rgr	100mg+0.005%-Rgr	80mg+0.004%-Rgr	800mg+0.004%-Rgr
Minimum weight (@ U=1 %, 2 sd), fine range ³⁾	—	—	—	120mg+0.004%-Rgr
Interface update rate	23 /s	23 /s	23 /s	23 /s
Usable height of draft shield	248 mm	175 mm	248 mm	175 mm
Weight of balance	7 kg	6.5 kg	7 kg	6.8 kg
Number of built-in reference weights ²⁾	1	1	1	1

Rgr= gross weight

Rnt= net weight (sample weight)

sd = Standard deviation

a = Year (annum)

¹⁾ In the temperature range 10...30 °C

²⁾ The reference weights are made from stainless antimagnetic chrome-nickel steel. The masses of the reference weights are traceable to the prototype kilogram which is the standard unit of mass kept in Paris.

³⁾ The minimum weight can be improved by the following measures:

- Selecting suitable weighing parameters
- Choosing a better location
- Using smaller taring containers

5.3.2 X-Ex2 precision weighing platform with readability of 10 mg / 0.1 g, "S" platform

	X4002SX	X6002SX	X4001SX
Limit values			
Maximum capacity	4.1 kg	6.1 kg	4.1 kg
Readability	10 mg	10 mg	100 mg
Maximum capacity, fine range	—	—	—
Readability, fine range	—	—	—
Taring range (from...to)	0 .. 4.1 kg	0 .. 6.1 kg	0 .. 4.1 kg
Repeatability (at nominal load)	sd 8 mg	8 mg	80 mg
Repeatability, fine range (at nominal load)	sd —	—	—
Linearity deviation	20 mg	20 mg	60 mg
Eccentricity deviation (test load)	30 mg (2 kg)	30 mg (2 kg)	200 mg (2 kg)
Sensitivity offset (test load)	60 mg (4 kg)	60 mg (6 kg)	240 mg (4 kg)
Sensitivity temperature drift ¹⁾	0.0003 %/°C	0.0003 %/°C	0.0015 %/°C
Sensitivity stability	0.0015 %/a	0.0015 %/a	0.005 %/a
Typical values			
Repeatability	sd 4 mg	4 mg	40 mg
Repeatability, fine range	sd —	—	—
Linearity deviation	7 mg	7 mg	20 mg
Eccentricity deviation (test load)	8 mg (2 kg)	8 mg (2 kg)	32 mg (2 kg)
Sensitivity offset (test load)	32 mg (4 kg)	30 mg (6 kg)	160 mg (4 kg)
Minimum weight (according to USP) ³⁾	12 g	12 g	120 g
Minimum weight (@ U=1%, 2 sd) ³⁾	800 mg	800 mg	8 g
Minimum weight (according to USP), fine range ³⁾	—	—	—
Minimum weight (@ U=1%, 2 sd), fine range ³⁾	—	—	—
Settling time	1.2 s	1.2 s	0.8 s
Dimensions			
Balance dimensions (WxDxH)	194x257x96 mm	194x257x96 mm	194x257x96 mm
Weighing pan dimensions	170x205 mm (WxD)	170x205 mm (WxD)	190x223 mm (WxD)
Typical uncertainties and supplementary data			
Repeatability	sd 4mg+0.00005%·Rgr	4mg+0.00003%·Rgr	40mg+0.0005%·Rgr
Repeatability, fine range	sd —	—	—
Differential linearity deviation	sd $\sqrt{(3ng \cdot Rnt)}$	$\sqrt{(2ng \cdot Rnt)}$	$\sqrt{(25ng \cdot Rnt)}$
Differential eccentric load deviation	sd 0.0002%·Rnt	0.0002%·Rnt	0.0008%·Rnt
Sensitivity offset	sd 0.0004%·Rnt	0.00025%·Rnt	0.002%·Rnt
Minimum weight (according to USP) ³⁾	12g+0.15%·Rgr	12g+0.09%·Rgr	120g+1.5%·Rgr
Minimum weight (according to USP), fine range ³⁾	—	—	—
Minimum weight (@ U=1%, 2 sd) ³⁾	800mg+0.01%·Rgr	800mg+0.006%·Rgr	8g+0.1%·Rgr
Minimum weight (@ U=1%, 2 sd), fine range ³⁾	—	—	—
Interface update rate	23 /s	23 /s	23 /s
Usable height of draft shield	—	—	—
Weight of balance	5.4 kg	5.4 kg	5.4 kg
Number of built-in reference weights ²⁾	1	1	1

Rgr = gross weight

Rnt = net weight (sample weight)

sd = Standard deviation

a = Year (annum)

¹⁾ In the temperature range 10...30 °C

²⁾ The reference weights are made from stainless antimagnetic chrome-nickel steel. The masses of the reference weights are traceable to the prototype kilogram which is the standard unit of mass kept in Paris.

³⁾ The minimum weight can be improved by the following measures:

- Selecting suitable weighing parameters
- Choosing a better location
- Using smaller taring containers

5.3.3 X-Ex2 precision weighing platform with readability of 0.1 g, "M" platform

	X6001MX	X12001MX
Limit values		
Maximum capacity	6.1 kg	12.1 kg
Readability	100 mg	100 mg
Maximum capacity, fine range	—	—
Readability, fine range	—	—
Taring range (from...to)	0 .. 6.1 kg	0 .. 12.1 kg
Repeatability (at nominal load)	sd 80 mg	80 mg
Repeatability, fine range (at nominal load)	sd —	—
Linearity deviation	60 mg	100 mg
Eccentricity deviation (test load)	200 mg (2 kg)	200 mg (5 kg)
Sensitivity offset (test load)	240 mg (6 kg)	600 mg (12 kg)
Sensitivity temperature drift ¹⁾	0.0015 %/°C	0.0015 %/°C
Sensitivity stability	0.005 %/a	0.005 %/a
Typical values		
Repeatability	sd 40 mg	40 mg
Repeatability, fine range	sd —	—
Linearity deviation	19 mg	34 mg
Eccentricity deviation (test load)	32 mg (2 kg)	30 mg (5 kg)
Sensitivity offset (test load)	180 mg (6 kg)	290 mg (12 kg)
Minimum weight (according to USP) ³⁾	120 g	120 g
Minimum weight (@ U=1%, 2 sd) ³⁾	8 g	8 g
Minimum weight (according to USP), fine range ³⁾	—	—
Minimum weight (@ U=1%, 2 sd), fine range ³⁾	—	—
Settling time	1 s	1.2 s
Dimensions		
Balance dimensions (WxDxH)	240x278x110 mm	240x278x110 mm
Weighing pan dimensions	237x237 mm (WxD)	237x237 mm (WxD)
Typical uncertainties and supplementary data		
Repeatability	sd 40mg+0.0003%-Rgr	40mg+0.00015%-Rgr
Repeatability, fine range	sd —	—
Differential linearity deviation	sd $\sqrt{(15ng \cdot Rnt)}$	$\sqrt{(25ng \cdot Rnt)}$
Differential eccentric load deviation	sd 0.0008%-Rnt	0.0003%-Rnt
Sensitivity offset	sd 0.0015%-Rnt	0.0012%-Rnt
Minimum weight (according to USP) ³⁾	120g+0.9%-Rgr	120g+0.45%-Rgr
Minimum weight (according to USP), fine range ³⁾	—	—
Minimum weight (@ U=1%, 2 sd) ³⁾	8g+0.06%-Rgr	8g+0.03%-Rgr
Minimum weight (@ U=1%, 2 sd), fine range ³⁾	—	—
Interface update rate	23 /s	23 /s
Usable height of draft shield	—	—
Weight of balance	6.9 kg	6.9 kg
Number of built-in reference weights ²⁾	1	1

Rgr= gross weight

Rnt = net weight (sample weight)

sd = Standard deviation

a = Year (annum)

¹⁾ In the temperature range 10...30 °C

²⁾ The reference weights are made from stainless antimagnetic chrome-nickel steel. The masses of the reference weights are traceable to the prototype kilogram which is the standard unit of mass kept in Paris.

³⁾ The minimum weight can be improved by the following measures:

- Selecting suitable weighing parameters
- Choosing a better location
- Using smaller taring containers

The precision balances with "M" platform are no longer available.

5.3.4 X-Ex2 precision weighing platform with readability of 0.1 g, "L" platform

	X32001LX	X64001LX
Limit values		
Maximum capacity	32.1 kg	64.1 kg
Readability	100 mg	100 mg
Maximum capacity, fine range	—	—
Readability, fine range	—	—
Taring range (from..to)	0 .. 32.1 kg	0 .. 64.1 kg
Repeatability (at nominal load)	sd 80 mg	100 mg
Repeatability, fine range (at nominal load)	sd —	—
Linearity deviation	300 mg	500 mg
Eccentricity deviation (test load)	300 mg (10 kg)	500 mg (20 kg)
Sensitivity offset (test load)	960 mg (32 kg)	1280 mg (64 kg)
Sensitivity temperature drift ¹⁾	0.001 %/°C	0.001 %/°C
Sensitivity stability	0.003 %/a	0.005 %/a
Typical values		
Repeatability	sd 40 mg	40 mg
Repeatability, fine range	sd —	—
Linearity deviation	200 mg	320 mg
Eccentricity deviation (test load)	200 mg (10 kg)	320 mg (20 kg)
Sensitivity offset (test load)	320 mg (32 kg)	380 mg (64 kg)
Minimum weight (according to USP) ³⁾	120 g	120 g
Minimum weight (@ U=1%, 2 sd) ³⁾	8 g	8 g
Minimum weight (according to USP), fine range ³⁾	—	—
Minimum weight (@ U=1%, 2 sd), fine range ³⁾	—	—
Settling time	1.5 s	1.8 s
Dimensions		
Balance dimensions (WxDxH)	—	—
Weighing pan dimensions	360x280 mm (WxD)	362x282 mm (WxD)
Typical uncertainties and supplementary data		
Repeatability	sd 40mg+0.00006%-Rgr	40mg+0.00006%-Rgr
Repeatability, fine range	sd —	—
Differential linearity deviation	sd $\sqrt{(300\text{ng}\cdot\text{Rnt})}$	$\sqrt{(400\text{ng}\cdot\text{Rnt})}$
Differential eccentric load deviation	sd 0.001%-Rnt	0.0008%-Rnt
Sensitivity offset	sd 0.0005%-Rnt	0.0003%-Rnt
Minimum weight (according to USP) ³⁾	120g+0.18%-Rgr	120g+0.18%-Rgr
Minimum weight (according to USP), fine range ³⁾	—	—
Minimum weight (@ U=1%, 2 sd) ³⁾	8g+0.012%-Rgr	8g+0.012%-Rgr
Minimum weight (@ U=1%, 2 sd), fine range ³⁾	—	—
Interface update rate	23 /s	23 /s
Usable height of draft shield	—	—
Weight of balance	12.4 kg	14.1 kg
Number of built-in reference weights ²⁾	2	2

Rgr = gross weight

Rnt = net weight (sample weight)

sd = Standard deviation

a = Year (annum)

¹⁾ In the temperature range 10...30 °C

²⁾ The reference weights are made from stainless antimagnetic chrome-nickel steel. The masses of the reference weights are traceable to the prototype kilogram which is the standard unit of mass kept in Paris.

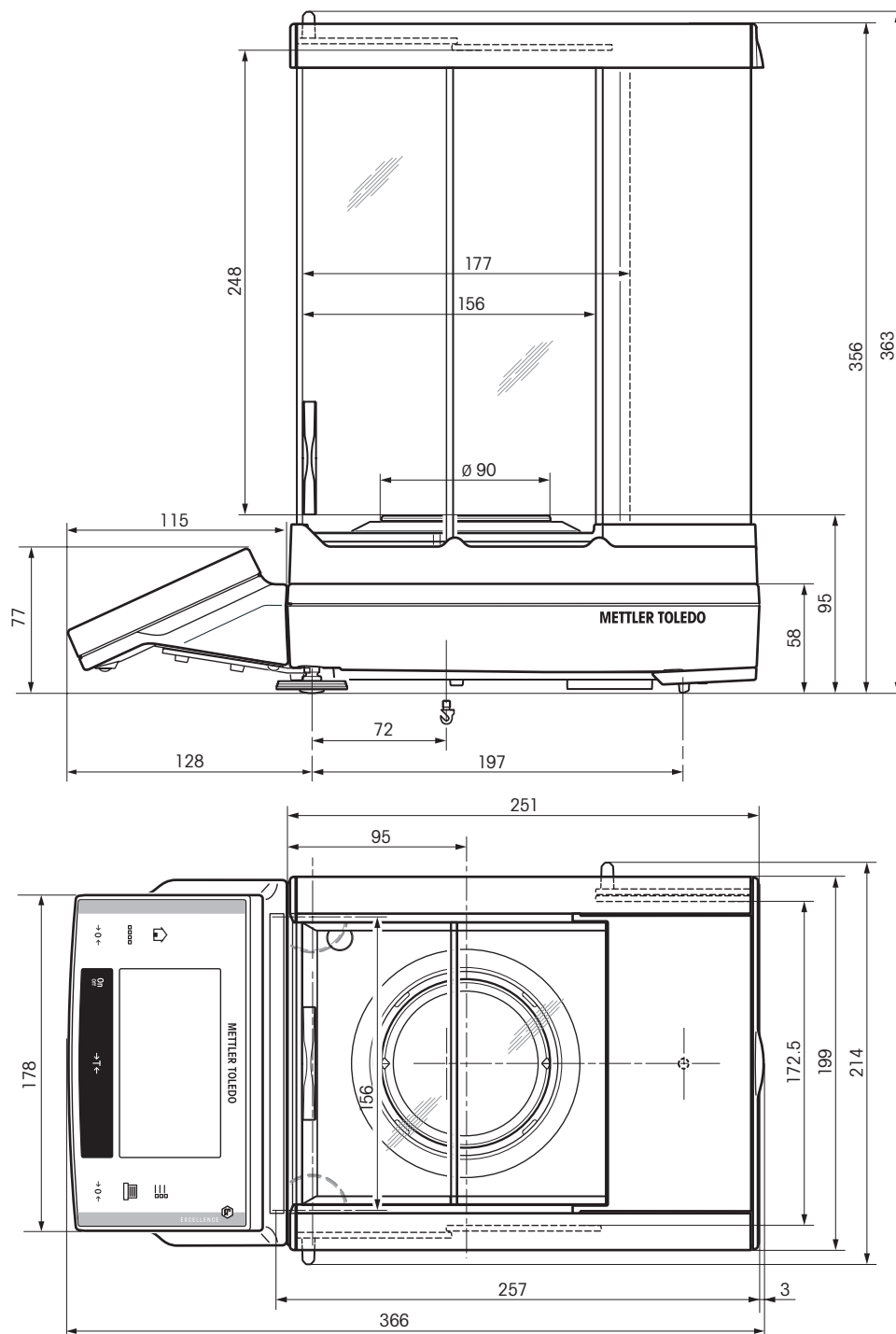
³⁾ The minimum weight can be improved by the following measures:

- Selecting suitable weighing parameters
- Choosing a better location
- Using smaller taring containers

5.4 Dimensions of the Excellence XS-Ex2 precision balances

5.4.1 XS-Ex2 precision balances with readability of 0.1 mg, "S" platform with draft shield

Models:
XS204SX



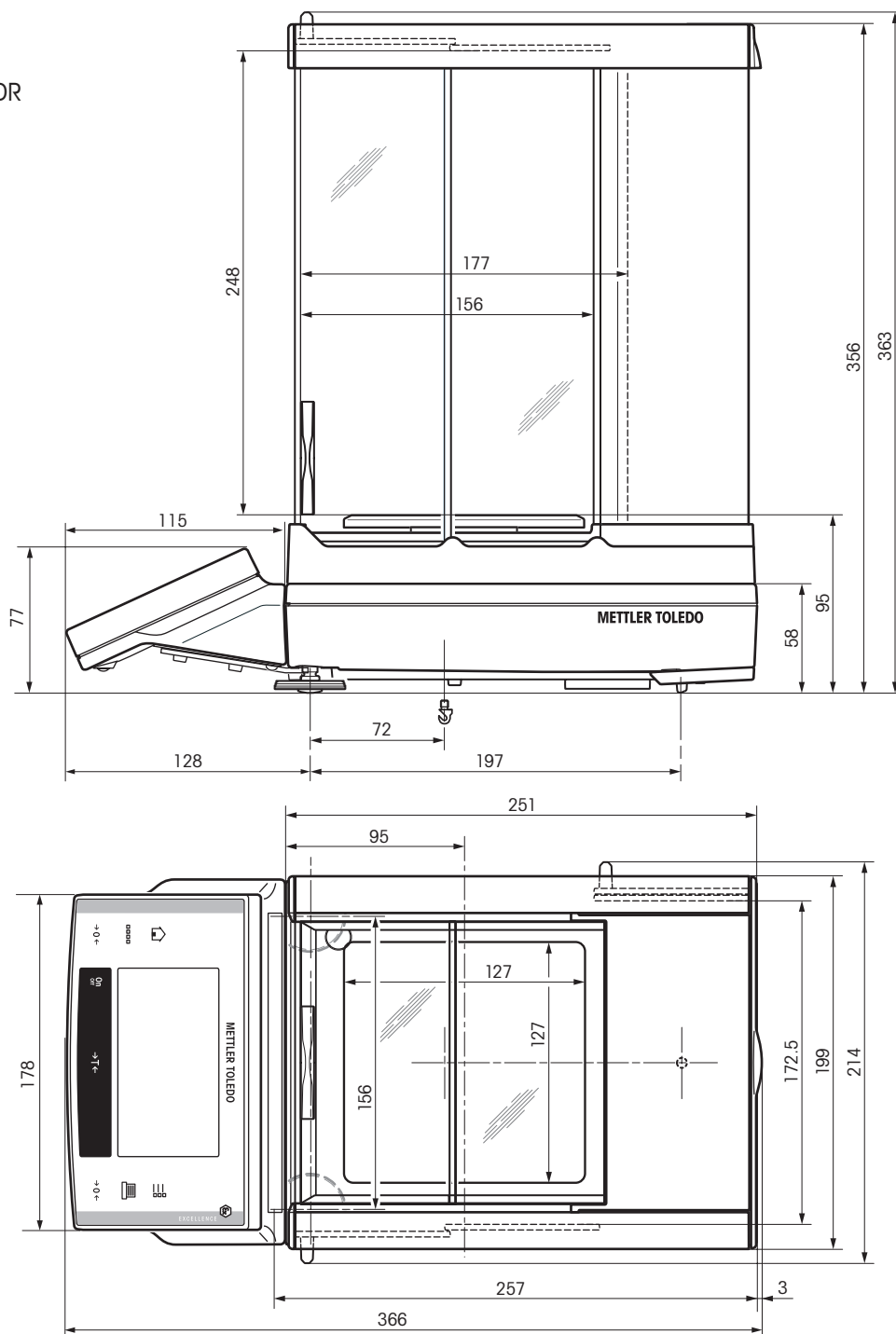
5.4.2 XS-Ex2 precision balances with readability of 1 mg, "S" platform with draft shield

Models:

XS603SX

XS1003SX

XS5003SXDR

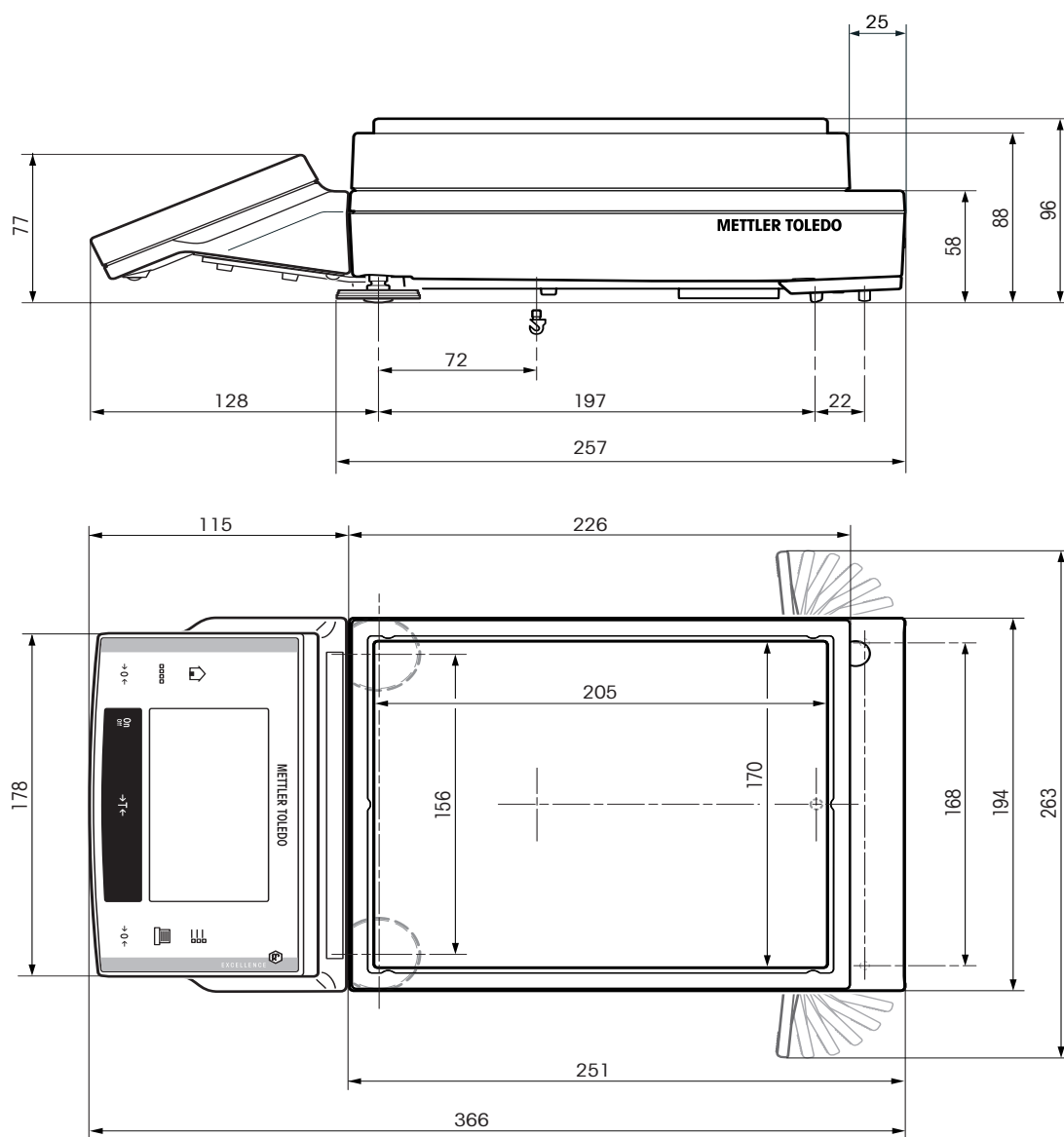


5.4.3 XS-Ex2 precision balances with readability of 10 mg, "S" platform with draft shield element

Models:

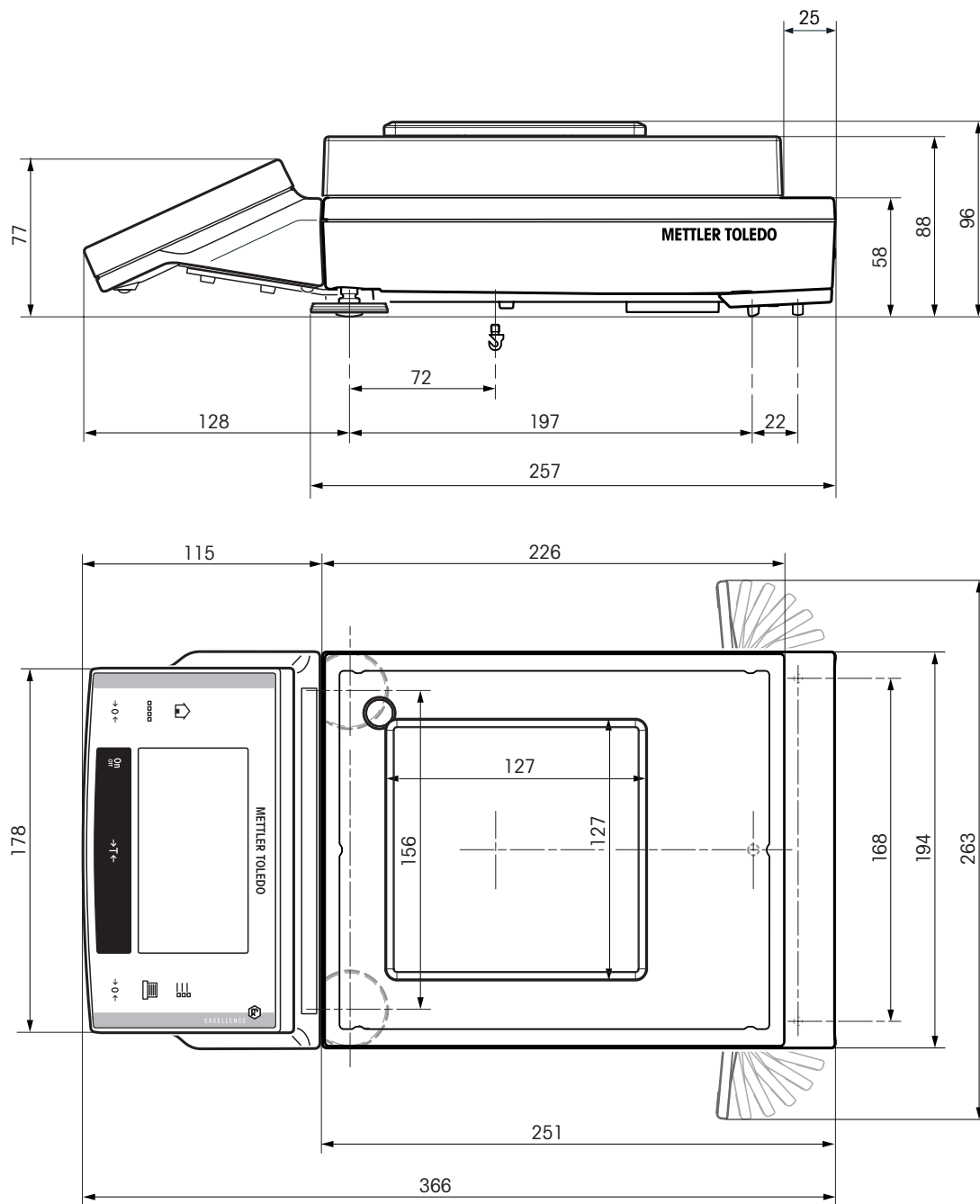
XS4002SX

XS6002SX



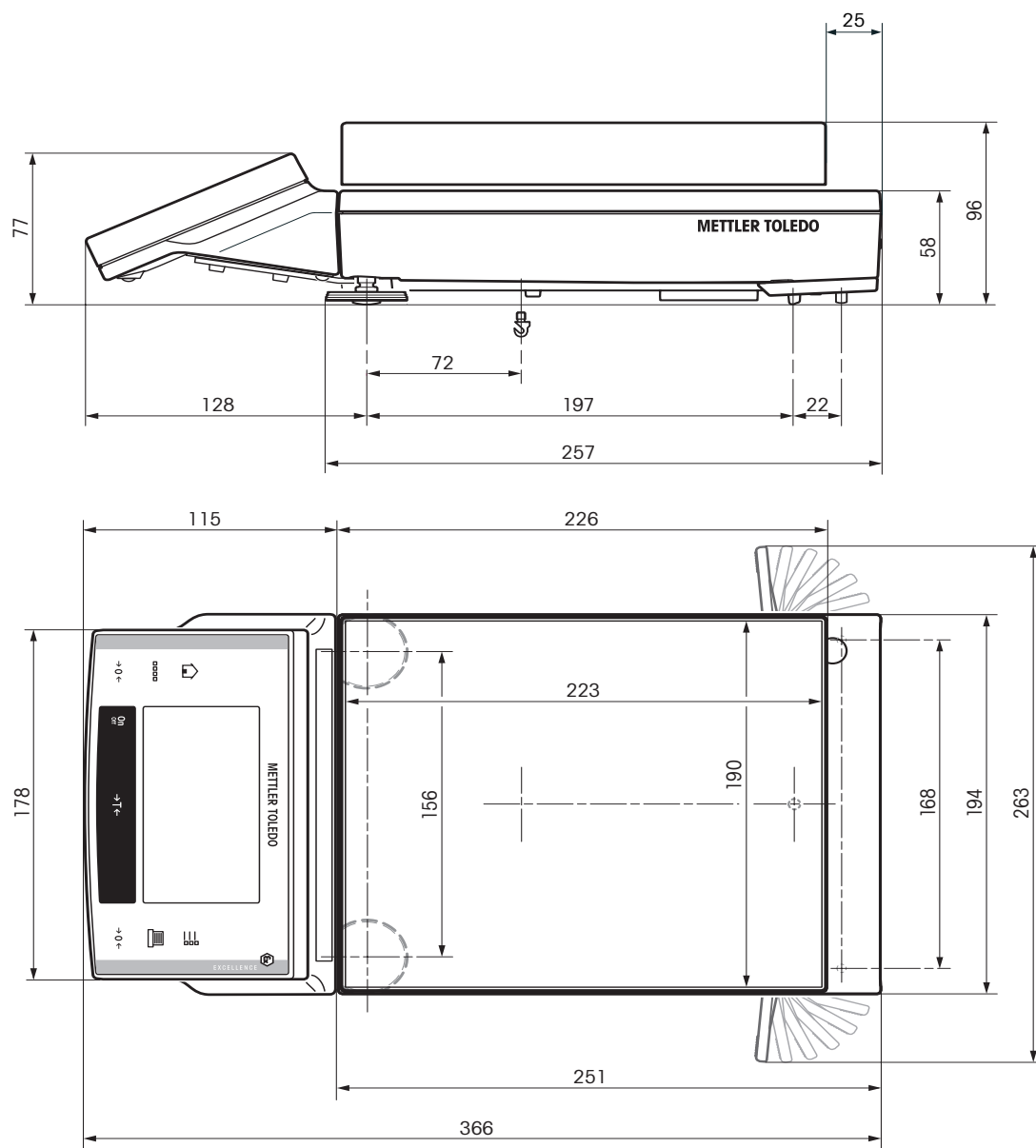
5.4.4 XS-Ex2 precision balances with readability of 0.1 mg, "S" platform

Models:
XS2004SX



5.4.5 XS-Ex2 precision balances with readability of 0.1 g, "S" platform

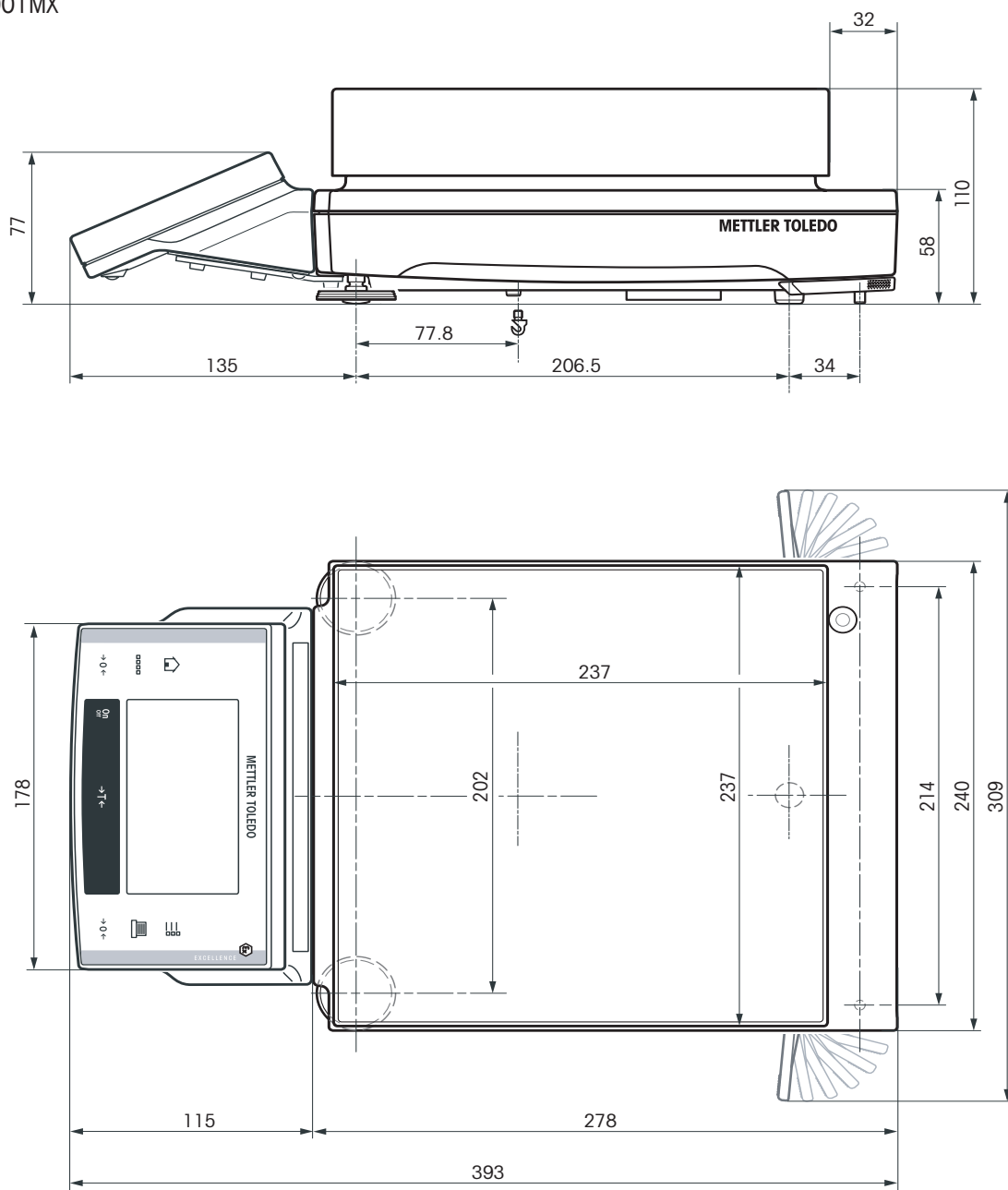
Models:
XS4001SX



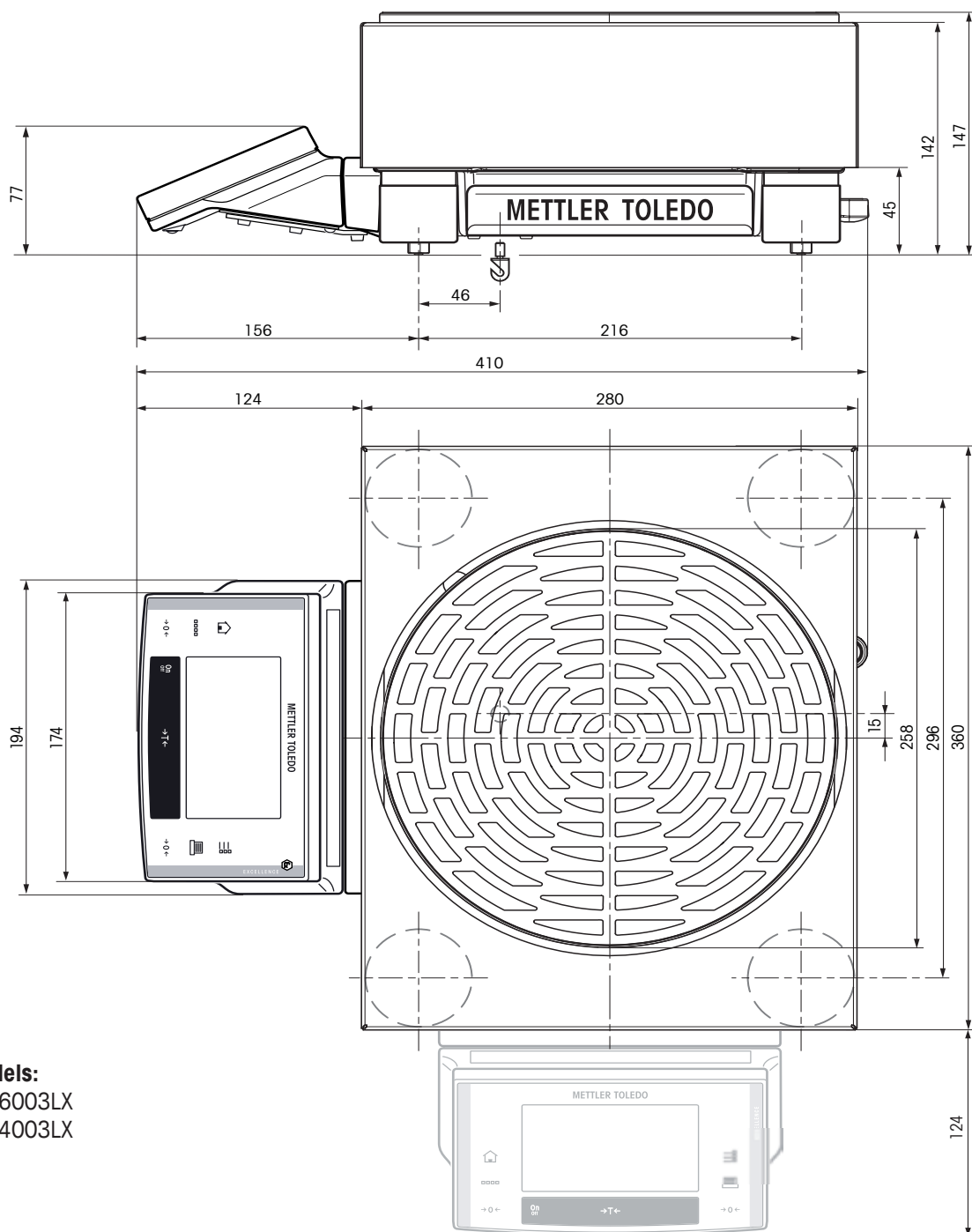
5.4.6 XS-Ex2 precision balances with readability of 10 mg / 0.1 g, "M" platform

Models:

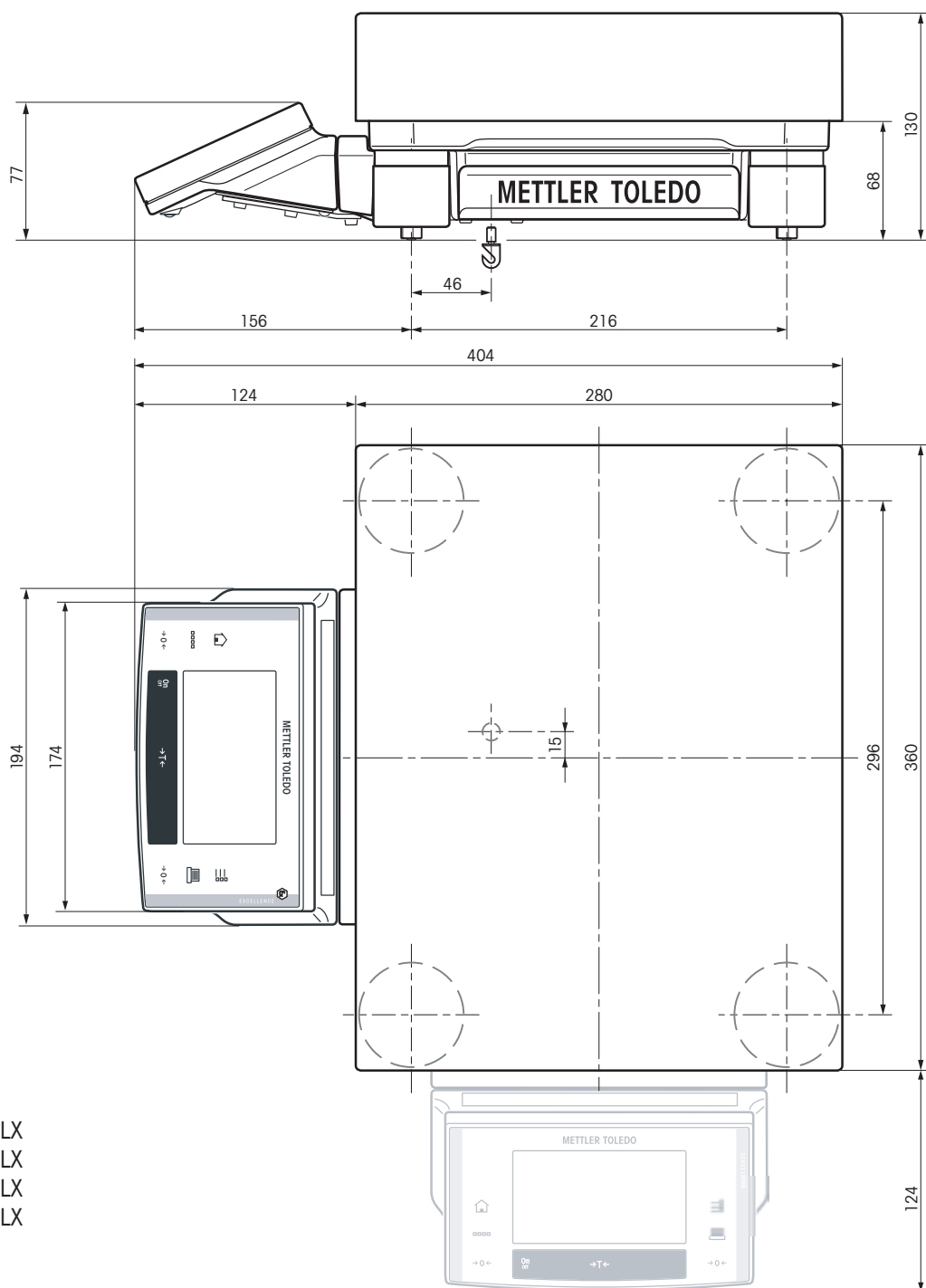
XS6001MX
XS6002MXDR
XS12001MX



5.4.7 XS-Ex2 precision balances with readability of 1 mg / 5 mg, "L" platform



5.4.8 XS-Ex2 precision balances with readability of 0.1 g / 1 g, "L" platform



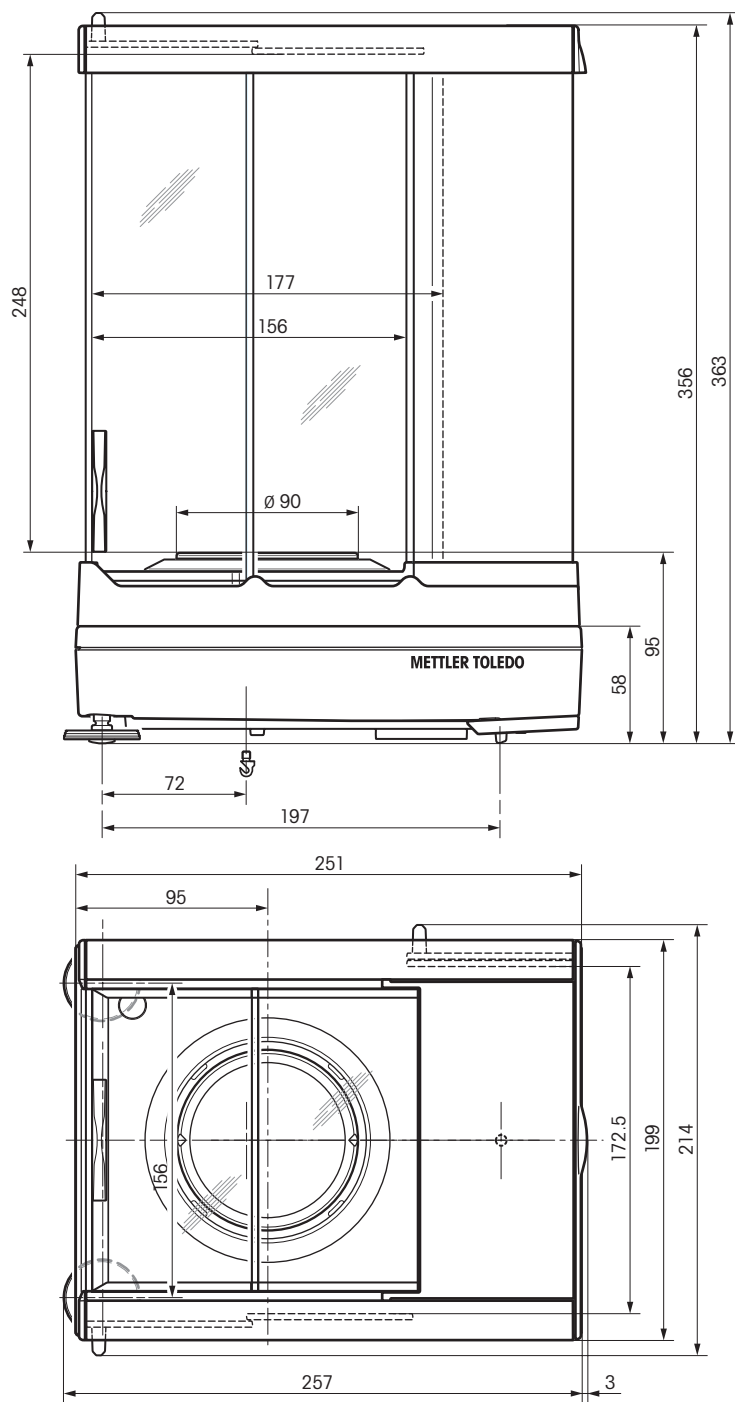
Models:

XS32001LX
XS64001LX
XS32000LX
XS64000LX

5.5 Dimensions of the Excellence X-Ex2 precision weighing platforms

5.5.1 X-Ex2 precision weighing platforms with readability of 0.1 mg, "S" platform with draft shield

Models:
X204SX



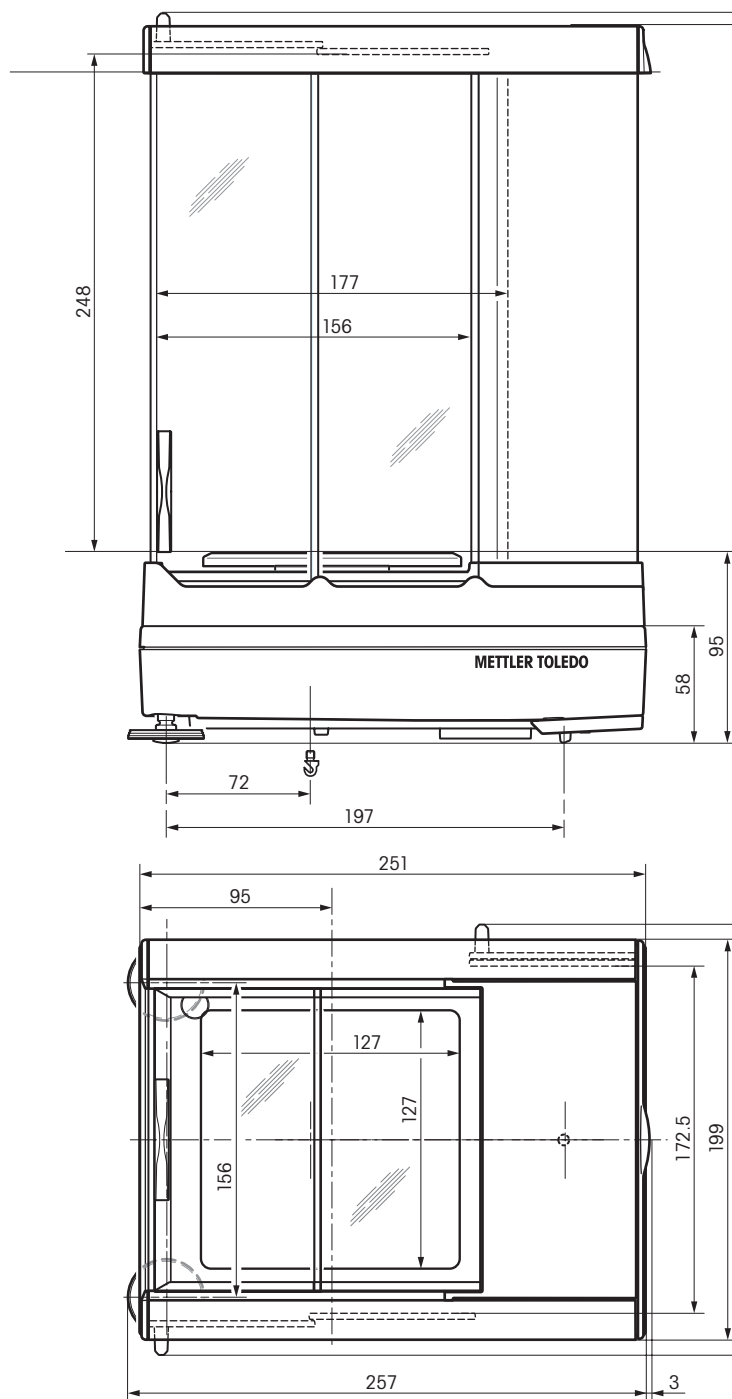
5.5.2 X-Ex2 precision weighing platforms with readability of 1 mg, "S" platform with draft shield

Models:

X603SX

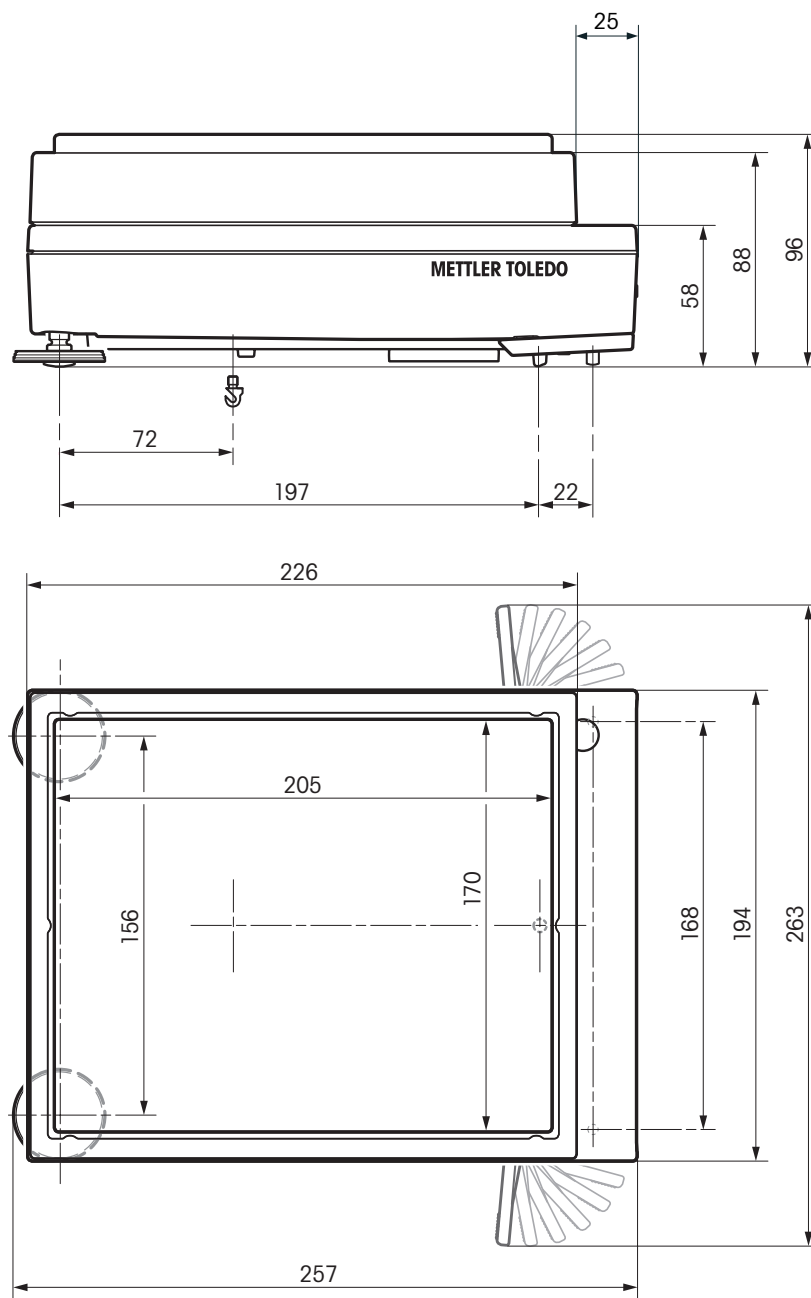
X1003SX

X5003SXDR



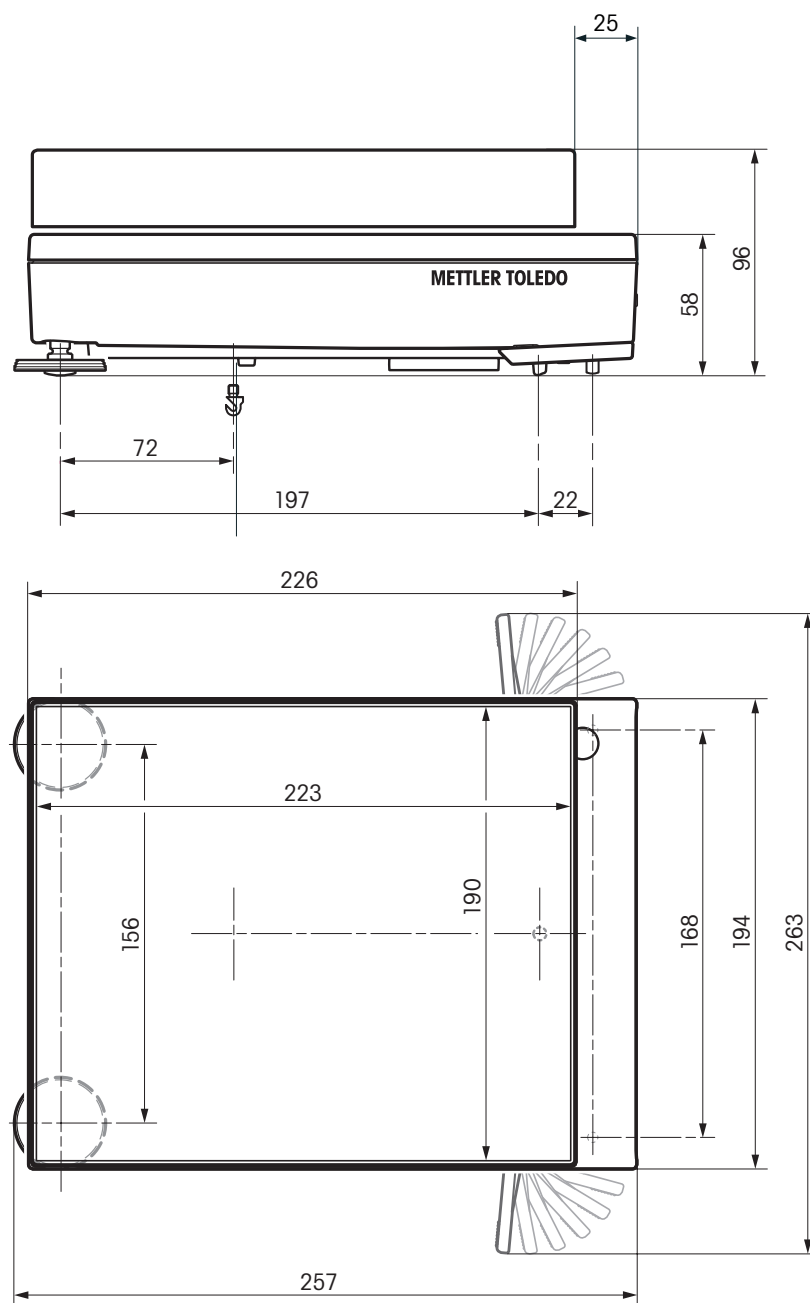
5.5.3 X-Ex2 precision weighing platforms with readability of 10 mg, "S" platform with draft shield element

Models:
X4002SX
X6002SX



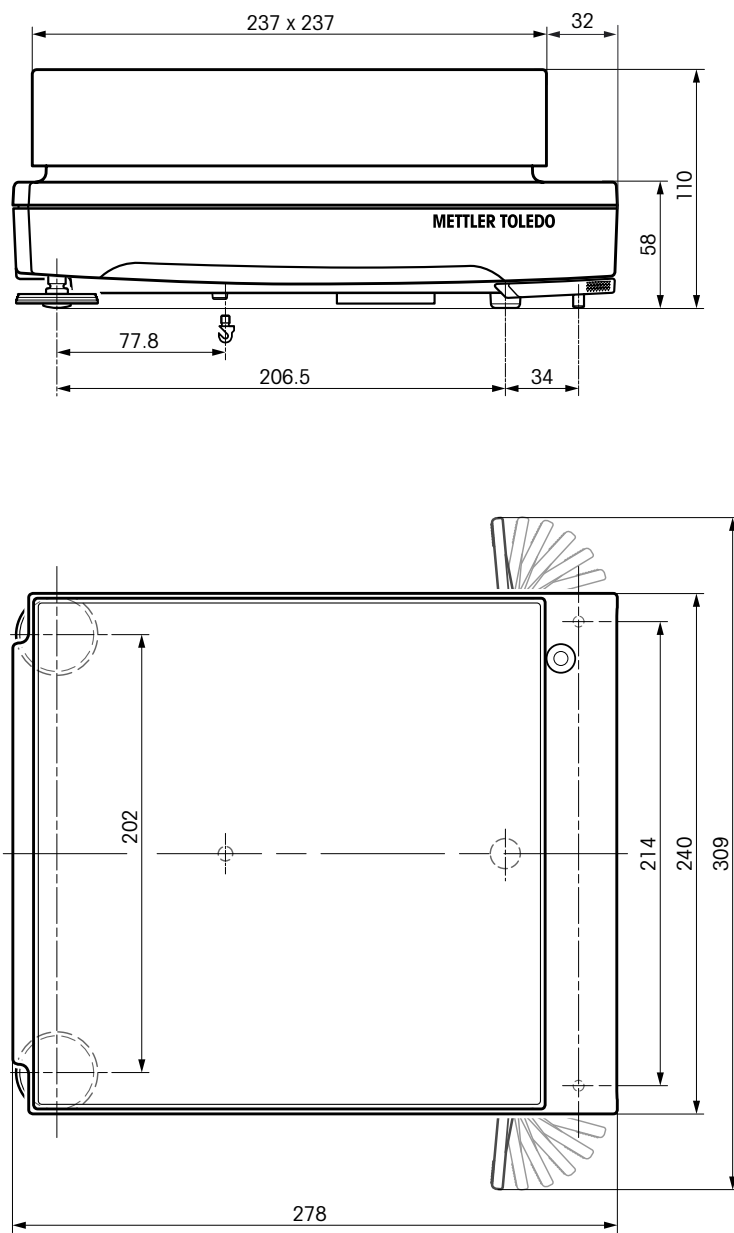
5.5.4 X-Ex2 precision weighing platforms with readability of 0.1 g, "S" platform

Models:
X4001SX



5.5.5 X-Ex2 precision weighing platforms with readability of 0.1 g, "M" platform

Models:
X6001MX
X12001MX

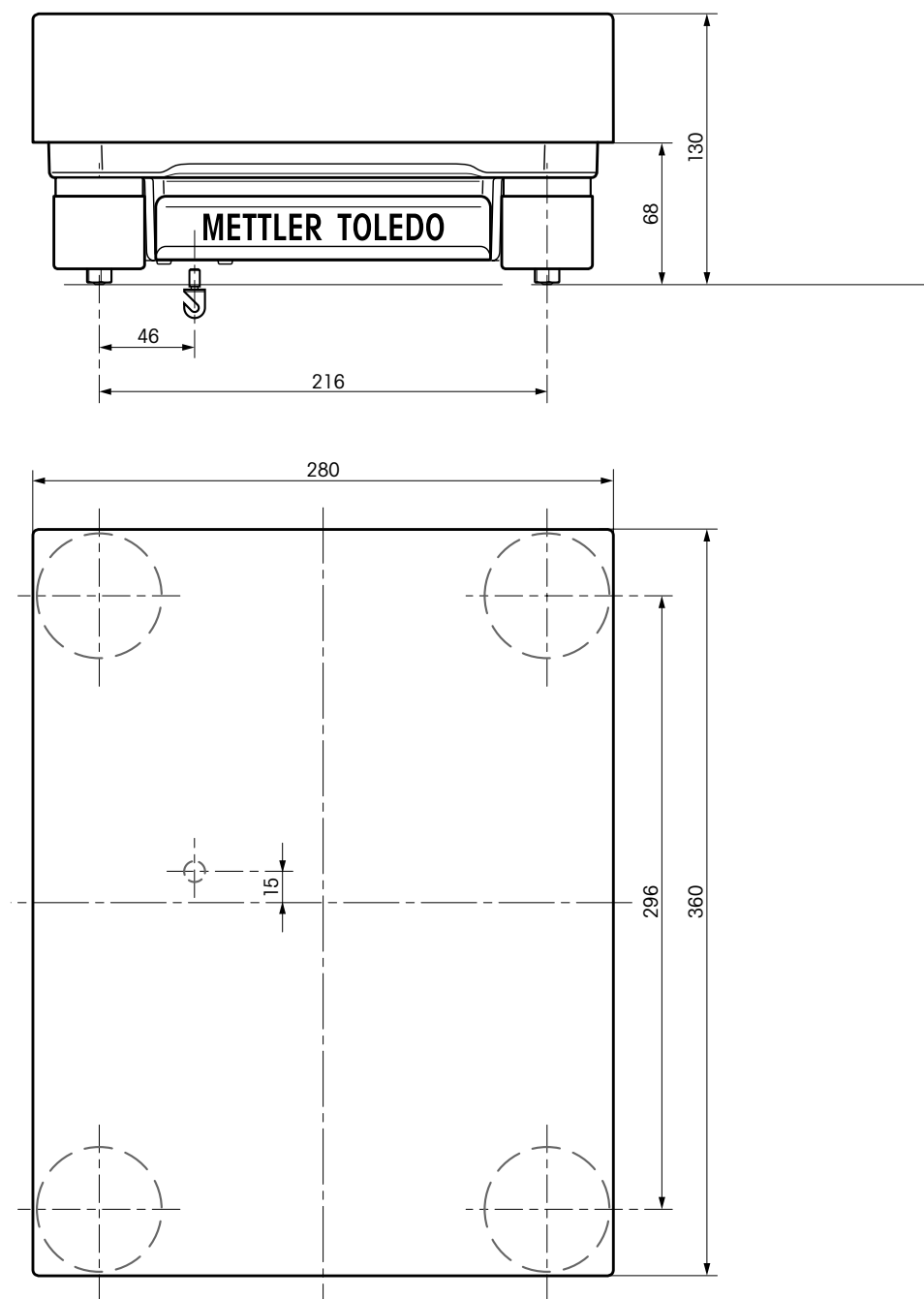


5.5.6 X-Ex2 precision weighing platforms with readability of 0.1 g, "L" platform

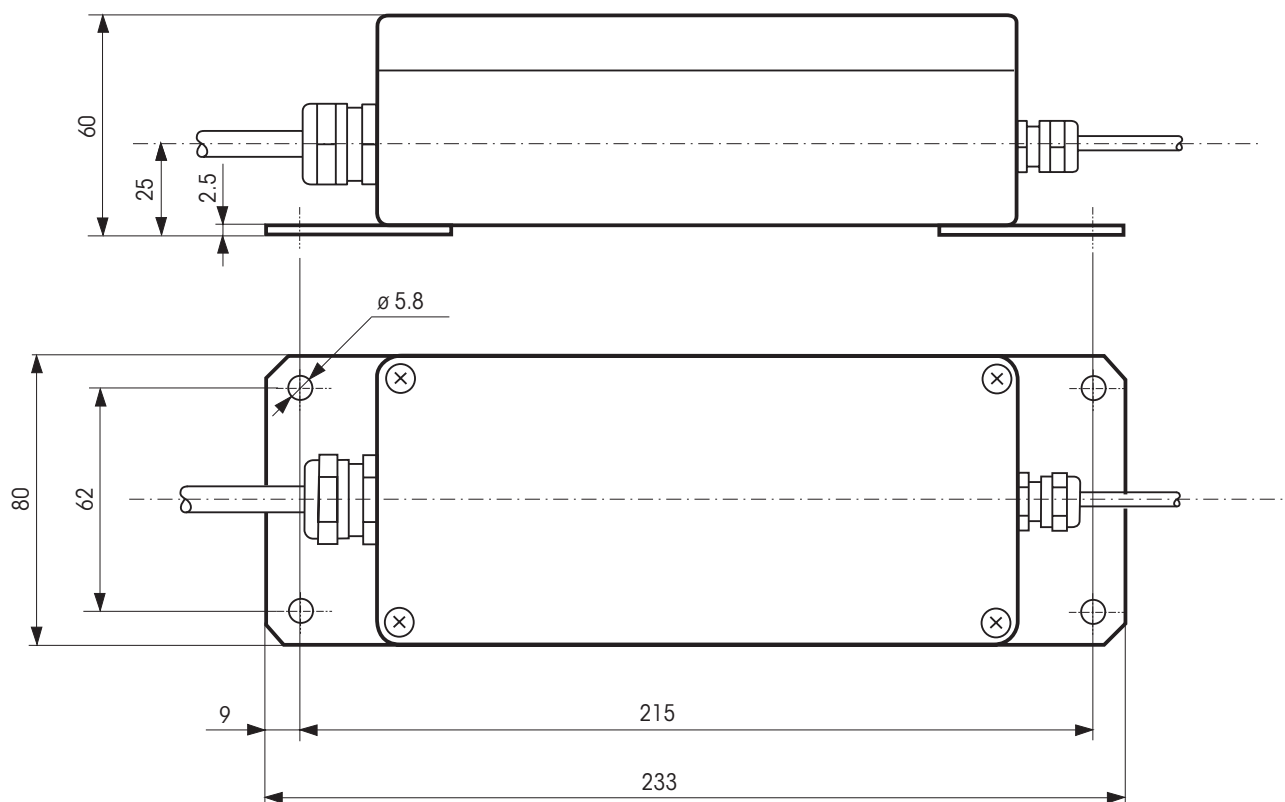
Models:

X32001LX

X64001LX



5.6 Dimensions of the AC adapter PSX2











6 Accessories and spare parts







6.1 Accessories

6.1.1 Accessories for all weighing platforms "S", "M" and "L"

You can increase the functionality of your balance with accessories from the METTLER TOLEDO range. The following options are available:

	Description	Part No.
	Printer (It is not permitted to use these units in Ex hazardous areas!)	
	BT-P42: Printer with wireless Bluetooth connection to balance	11132540
	RS-P42: Printer with RS232C connection to balance	00229265
	Optional interfaces	
	BT option: Interface Bluetooth, multipoint connection for up to 6 Bluetooth devices (XS-Ex2 models only)	11132530
	BTS option: Interface Bluetooth, single-point connection	11132535
	Ethernet option: Interface Ethernet for connection to Ethernet network	11132515
	RS232C option: Interface for connection of a printer (RS232C), computer or titrator	11132500
	Cable for RS232C interface Fiber-optic cable with 9-pin RS connector and opto-electric converter with galvanic isolation. For data transmission without hardware handshake.	00224265
	Auxiliary display (It is not permitted to use these units in Ex hazardous areas!) (displays only the weight value and unit, if defined)	
	BT-BLD Bluetooth auxiliary display for table mounting, 168 mm, LCD display with backlighting	11132555
	RS/LC-BLDS auxiliary display for table or balance mounting, 480 mm, LCD display with backlighting	11132630
	RS/LC-BLD auxiliary display for table mounting, 168 mm, LCD display with backlighting	00224200
	Sensors ErgoSens, optical sensor for hands-free operation	11132601

Description	Part No.
 <p>Anti-theft device Steel cord</p>	11600361
 <p>AC adapter PSX2 AC adapter PSX2 (not included in the scope of delivery for the balance/weighing platform)</p>	11132730
 <p>Software LabX Software for One Click™ Weighing Solutions Enables you to perform One Click™ Standard Preparation, One Click™ Loss on Drying, One Click™ Sieve Analysis and many other applications. Simply start the method with the One Click™ shortcut on the balance touchscreen. LabX guides you step-by-step through the SOP on the balance, performs your calculations automatically, and takes care of saving all your data. The complete solution can be tailored to match your process requirements. Visit www.mt.com/one-click-weighing for more information</p>	11153120
<p>Freeweigh.Net</p>	21900895
 <p>Production certificate Production Certificate "PRO" for XS Balances</p>	11106895

Description		Part No.	Platform "S"	Platform "M"	Platform "L"
	Weighing pan MPS (Magnetic Protection Shield) weighing pan for 0.1 g models 190 x 223 mm	11132625	x	—	—
	MPS (Magnetic Protection Shield) weighing pan for 10 mg models 170 x 205 mm	11132626	x	—	—
	Weighing pan 190 x 223 mm, incl. pan support	11132655	x	—	—
	Weighing pan 170 x 205 mm, incl. pan support and draft shield element	11132660	x	—	—
	Stands Terminal stand for placement of the terminal 30 cm above the weighing pan, ("S" and "M" platform)	11132636	x	x	—
	Terminal stand for placement of the terminal 30 cm above the weighing pan, ("L" platform)	11132653	—	—	x
	Draft shields "Magic Cube" Draft shield for 1 mg models, usable height 175 mm	11131650	x	—	—
	Simple draft shield 0.1 g* and 10 mg models, usable height 175 mm * for the 0.1 g model the weighing pan set "11132660" must be ordered additionally	11131653	x	—	—
	Draft shield to cover the entire balance "XP-W12" 300 x 450 x 450 mm (W x D x H)	11134430	x	x	—
	Draft shield to cover the entire balance "XP-W64" 550 x 470 x 580 mm (W x D x H)	11134470	—	x	x
	Density determination kit Kit for density determination of solids and liquids (for 1 mg and 0.1 mg models)	11132680	x	—	—
	Sinker 10 ml: To density determination of solids and liquids	00210260	x	—	—
	Sinker 10 ml: Calibrated, with certificate	00210672	x	—	—
	Recalibration of your 10 ml sinker and new certificate	00210674	x	—	—
	Calibrated thermometer: Certified model	11132685	x	—	—
	Hook for weighing below the balance Hook for the hanger (XS16001M, XS16000M models and "L" platform)	11132565	—	x	x
	Transport cases Transport case for XS balances, "S" platform	11132595	x	—	—

6.2 Spare parts

	Pos	Description	Part No.
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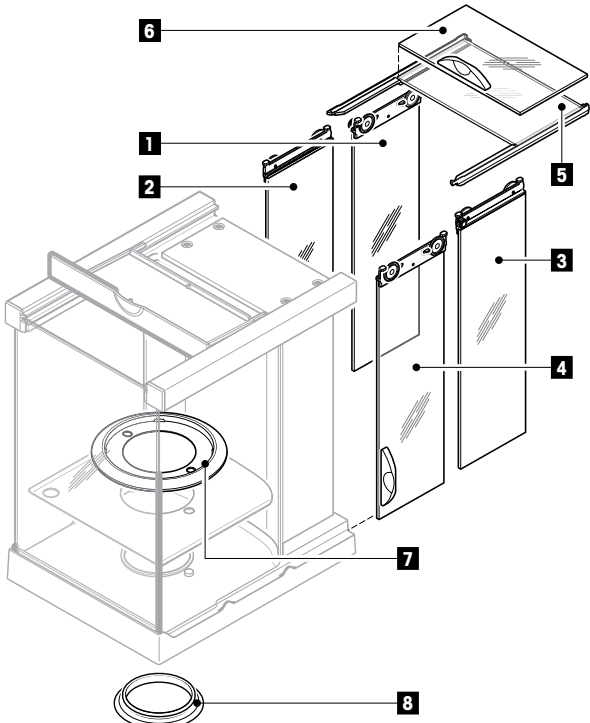


Diagram showing the assembly of the draft shield. Components are labeled 1 through 8. 1 and 2 are door hinges, 3 and 4 are door panels, 5 is a door handle, 6 is the draft shield frame, 7 is the draft shield element, and 8 is the ring seal.

Draft shield "Pro" (0.1 mg and 1 mg)			
1		Door back left	11133079
2		Door front left	11133080
3		Door back right	11133077
4		Door front right	11133078
5		Door top back	11133081
6		Door top front	11133082
7	0.1 mg	Draft shield element	11131531
8	0.1 mg	Ring seal	11131551

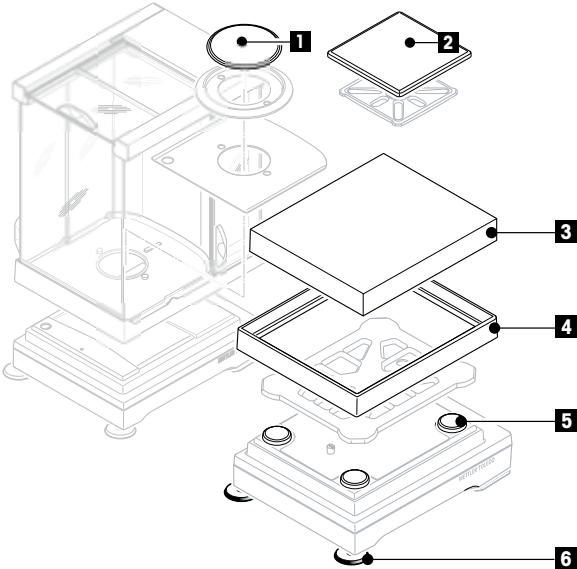


Diagram showing the assembly of the weighing pans and support. Components are labeled 1 through 6. 1 and 2 are weighing pans, 3 is the weighing pan support, 4 is the draft shield element, 5 is the weighing pan support, and 6 is the leveling screw.

Weighing pans			
for weighing platform "S"			
1	1 mg	Weighing pan 127 x 127 mm	11131022
2	1 mg	Weighing pan 127 x 127 mm	11131022
3	10 mg	Weighing pan 170 x 205 mm	11131030
3	0.1 g	Weighing pan 190 x 223 mm	11131031
4	10 mg	Draft shield element	11131040
for weighing platform "M"			
3		Weighing pan 237 x 237 mm	11131173
for weighing platform "L"			
3	64 kg	Weighing pan 280 x 360 mm	11131031
3	64 kg	Weighing pan 280 x 360 mm	11131031
Weighing pan support			
5	≥ 10 mg	for weighing platform "S" and "M"	11131029
5		for weighing platform "L"	00239104
Leveling screw			
6		for weighing platform "S" and "M"	11106323

Pos	Description	Part No.
Transport		
Weighing platform "S", models X/XSxxx4SX (0.1 mg)		
	Packaging	11133052
	Export carton	11132834
	Packaging Draft shield	11133054
	Export carton Draft shield	11132867
Weighing platform "S", models X/XSxxx3SX (1 mg)		
	Packaging	11133053
	Export carton	11132834
	Packaging Draft shield	11133054
	Export carton Draft shield	11132867
Weighing platform "S", models X/XSxxx2SX (10 mg)		
	Packaging	11133050
	Export carton	11132839
Weighing platform "S", models X/XSxxx1SX (0.1 g)		
	Packaging	11133051
	Export carton	11132839
Weighing platform "M", models X/XSxxxMX		
	Packaging	11133056
	Export carton	11132879
Weighing platform "L", models X/XSxxxLX		
	Packaging	11133057
	Export carton	11132912



Appendix

(13)

(14)

type examination certificate SEV 06 ATEX 0103 X

(15) Description of the equipment

The Mettler Toledo power supply type PSX2 (category 3G) serves as a power supply for weighing systems XS xxxxx xX xx and platforms X xxxxx xX xx within hazardous areas of zone 2.

Ratings

Supply circuit

230 V AC ($\pm 10\%$) / 0,1A / 50Hz

(Cable end)

or

115 V AC ($\pm 10\%$) / 0,1A / 50Hz

Output circuit

with type of protection "limited power" Ex nL IIC

(Cable end with special connector)

Maximum values:

$U_o \leq 13,5 \text{ V}$

$I_o \leq 1,2 \text{ A}$

$P_o \leq 6,0 \text{ W}$

$C_o \leq 213,0 \text{ nF}$ (max. permissible external capacitance)

$L_o \leq 10,0 \text{ }\mu\text{H}$ (max. permissible external inductance)

Note(s)

- According to RL 94/9/EC (ATEX 95) Appendix I, the Mettler Toledo power supply type PSX2 is a device of equipment group II, category 3G which, according to RL 99/92/EC (ATEX 137) can be used in zone 2 as well as gas groups IIA and IIB and IIC, which are potentially explosive due to combustible substances in the temperature classes T1 to T5. For use/installation, the requirements of EN 60079-14 must be observed.
- The permissible ambient temperature range is -10°C to $+40^\circ\text{C}$.

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Appendix to type examination certificate SEV 06 ATEX 0103 X

- (16) Test report 05-IK-0249.01 incl. extension 1
- (17) Special conditions
1. The supply cable (power supply cable) of the Mettler Toledo power supply type PSX2 must be installed protected against mechanical damage.
 2. Only the special connector of the output circuit may be connected and disconnected when connected live to a load, e.g. a weighing device.
 3. A load that can be connected to the power supply must - including connecting cable - have a maximum internal inductance of $\leq 10\mu\text{H}$ and a maximum internal capacitance of $\leq 213\text{nF}$.
- (18) Fundamental essential health and safety requirements
Fulfilled by the standards applied.

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Martin Plüss
Product Certification



Fehraltorf, 2010-04-26

Replaces certificates dated
2000-04-03
Extension 1; new issued Standards

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7.2 Balances XS-Ex2 and platforms X-Ex2





(1) **Type Examination Certificate**

(2) Equipment and protective systems intended for use in potentially explosive atmospheres - **Directive 94/9/EC**

(3) Test Certificate Number
SEV 06 ATEX 0104 X

(4) Equipment: Weighing system type XS xxxxx xX xx and type X xxxxx xX xx

(5) Manufacturer: Mettler-Toledo AG

(6) Address: Im Langacher 44, CH-8606 Greifensee

(7) This equipment and any acceptable variation thereto are specified in the schedule to this certificate and the documents therein referred to.

(8) Electrosuisse SEV certifies that this equipment has been found to comply with the essential health and safety requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres, given in Annex II to the Directive.
The results of the examination are recorded in the confidential report No. 05-IK-0249.02 incl. extension 1

(9) Compliance with the essential health and safety requirements has been assured by compliance with:
EN 1127-1:2007 EN 60079-0:2006 EN 60079-15:2005

(10) If the sign «X» is placed after the certificate number, it indicates that the equipment is subjected to special conditions for safe use specified in the schedule to this certificate.

(11) This type examination certificate relates only to the design and construction of the specified equipment in accordance with Directive 94/9/EC. Further requirements of this directive apply to the manufacture and the placing on the market of this equipment.

(12) The marking of the equipment shall include the following:
 II 3G Ex nL IIC T5

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Appendix

(13)

(14)

type examination certificate SEV 06 ATEX 0104 X

(15) Description of the equipment

The weighing system type XS xxxxx xX xx and type X xxxxx xX xx serve for weighing within hazardous areas of zone 2.

The weighing systems can be fitted with an optional Bluetooth, Ethernet or RS232 interface.

The weighing systems type XS xxxxx xX xx are provided either with a direct-mounted operator terminal (touch screen) or operator terminal (touch screen) on a stand for positioning 30 cm above the weighing pan.

The weighing systems (weighing platforms) type X xxxxx xX xx are standalone devices without operator terminal (touch screen).

Ratings

Supply circuit

(with special two-pin connector)

with type of protection "limited power" Ex nL IIC

Only for connection to a certified circuit with "limited power".

Maximum values:

$$U_i \leq 13,5 \text{ V}$$

$$I_i \leq 1,2 \text{ A}$$

$$P_i \leq 6,0 \text{ W}$$

$$C_i = 0 \text{ nF (effective internal capacitance)}$$

$$L_i = 0 \text{ }\mu\text{H (effective internal inductance)}$$

Data circuits for peripheral devices via installed:

Ethernet interface or
RS232 interface

Only for connection to an approved peripheral device within the hazardous area with a signal circuit with the type of protection "limited power" Ex nL IIC or a peripheral device outside the hazardous area with a signal circuit with the type of protection "limited power" Ex [nL] IIC.

Data circuits for peripheral devices via installed:

Bluetooth interface

Wireless supply via Bluetooth
frequency band of 2,4GHz / 1mW.

Note(s)

1. According to RL 94/9/EC (ATEX 95) Appendix I, the weighing systems type XS xxxxx xX xx and type X xxxxx xX xx are devices of equipment group II, category 3G which, according to RL 99/92/EC (ATEX 137) can be used in zone 2 as well as gas groups IIA and IIB and IIC, which are potentially explosive due to combustible substances in the temperature classes T1 to T5.

For use/installation, the requirements of EN 60079-14 must be observed.

2. The permissible ambient temperature range is +5°C to +40°C.

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Appendix to type examination certificate SEV 06 ATEX 0104 X

- (16) Test report 05-IK-0249.02 incl. extension 1
- (17) Special conditions
1. The weighing systems type XS xxxxx xX xx and type X xxxxx xX xx may only be used indoors in clean rooms.
 2. The device and protective cover may only be cleaned with a moist cloth.
- (18) Fundamental essential health and safety requirements
Fulfilled by the standards applied.

Electrosuisse SEV
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GWP® – Good Weighing Practice™

The global weighing guideline GWP® reduces risks associated with your weighing processes and helps to

- choose the appropriate balance
- reduce costs by optimizing testing procedures
- comply with the most common regulatory requirements

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Subject to technical changes

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